10¢ A COPY

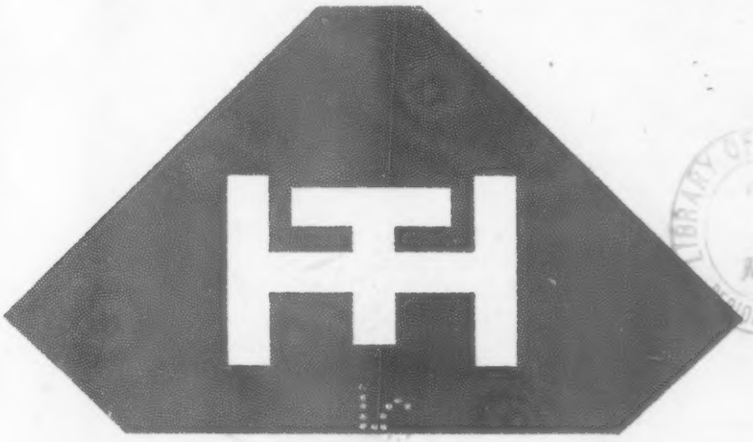
The OIL WEEKLY

Exclusively Devoted To The Production and Transportation of Oil and Gas

March 22, 1929 — June 14, 1929 **Volume 53. No. 1**

W. Gpr

For Nearly 20 Years~ A HUGHES POLICY



No Hughes Tool Company Product is offered for sale to the industry until actual field performances have proven it to be the most effective tool for the purpose for which it was designed.

Hughes Tools—Sold by Supply Stores Everywhere

HUGHES TOOL COMPANY

Service Plants
Los Angeles, Calif.
Oklahoma City, Okla.

Main Office and Plant
HOUSTON
TEXAS

Export Office
Woolworth Bldg.
New York City

TN860
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"IF IT'S WORTH DRILLING FOR, IT'S WORTH SAVING"

for REPRESSURING

Smith Separators are "standard" equipment

Reprinted from National Petroleum News

The illustration above shows the remarkably efficient hook-up on the Roeser & Pendleton property near Breckenridge, Texas, for determining and controlling air and gas pressure and production.

The accompanying picture shows a Smith Separator with manifold and orifice meter installation on one lease. All wells on the lease are pumped into the Smith Separator with the manifold. One well each day is by-passed into the smaller Separator shown at the right in the photograph and from the small Separator the oil and water go to the individual gauge tank located at the battery of stock tanks while the gas goes through the orifice meter shown midway between the two Separators. The gas is returned to the main gas line from the lease to the compressors. Information thus obtained is utilized in the back pressure control work.

For complete information regarding the profit possibilities of Smith Separators ask any Smith Separator representative or write direct for illustrated catalog.

Type No. 1

SMITH SEPARATOR COMPANY

Tulsa — *Okla.*

Export Office: **Oilfield Equipment Co., 30 Church St., New York City**

HOUSTON **FORT WORTH** **SHREVEPORT** **LOS ANGELES**

The OIL WEEKLY. Issued weekly by the Gulf Publishing Co., 3301 Buffalo Drive, Houston, Texas. Subscription price $1.00 per year; 10 cents per copy. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1897.

. . . . . *all combined in a pump you really should investigate!*

Here, men, is a pump built after your own hearts.

Designed to take punishment and ask for more. As husky a "baby" as has ever been made for this class of service and yet the smoothest, slickest in point of operation, you've ever seen or heard!

TIMKEN roller-bearings in drive and crank shaft. Positive, *automatic* lubrication. Center drive with herring-bone gears. Dust-proof crank case. Gas engine or electric motor operation. Ideal for any service within its limitation!

Every man who has to do with pump purchase, service or operation wants to keep abreast of pump developments. Here is a model that merits investigation. Ask us to give you full details.

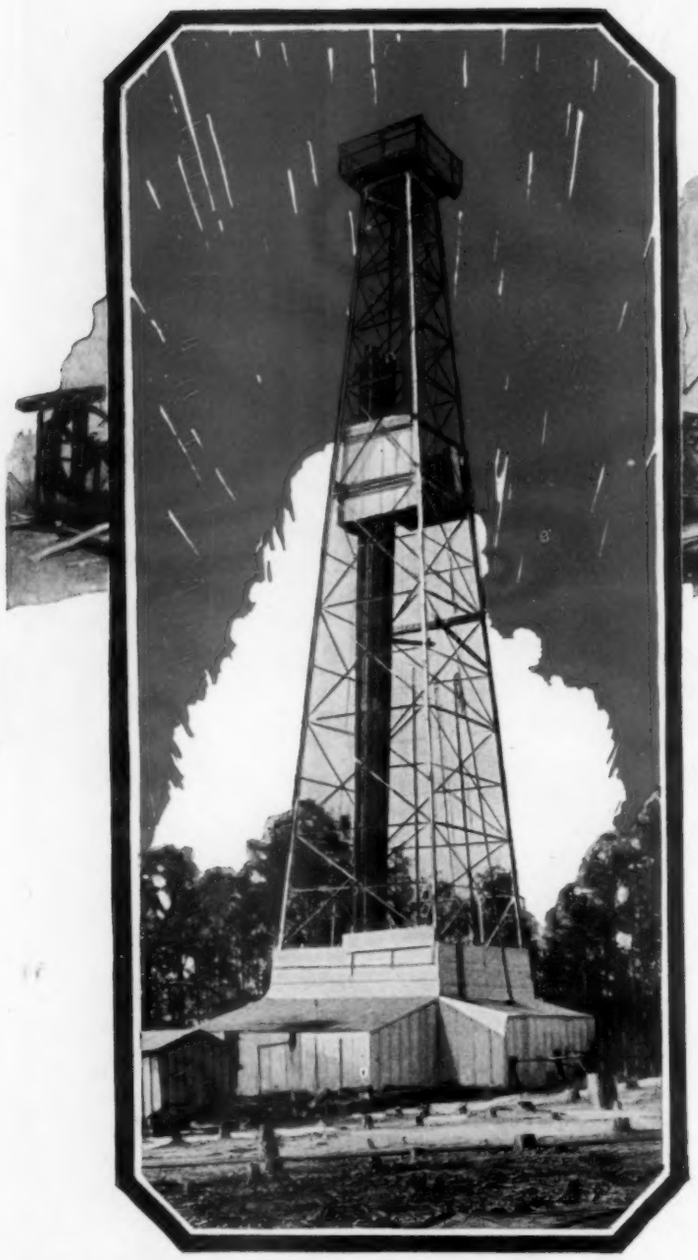
GASO PUMP & BURNER MFG. COMPANY
Tulsa, Oklahoma
Texas Office—
210 Petroleum Bldg., Fort Worth, Texas

Illustration shows cover removed.

Gaso Enclosed Type All Timken Bearing Power Pump. Available in three types of fluid end—(1) Valve Pot Type, (2) 7-inch Suction Type, and (3) Interchangeable Liner Type (as shown in the illustration). Capacity of the Interchangeable Liner fluid end varies from 63 barrels per hour at 800 pounds pressure, with 2¼-inch liner, to 250 barrels per hour at 250 pounds pressure, with 5-inch liner.

GASO PUMPS
for every oil industry need

When Hurrican
The Oil Fields



SPRING hurricanes, sweeping through the country, will soon take their toll from the oil fields. Operators using IDECO derricks have guarded their property, their production, and the lives of their men against this possibility of disaster.

A feature of IDECO derricks is the small wind surface. IDECO double bay bracing provides greater strength, eliminates all unneces-

IDECO Derricks

THE INTER
COLUMBUS,

Branches and Stocks:—
Odessa, Amarillo, Luling, Lake Charles, Louisiana; El Drumright, Shidler, Okemah, Maracaibo, Venezuela.
Export Representation—

es Lash

sary parts, is easier to erect, and offers from 30% to 60% less surface exposed to the wind. The advantages of this construction have long been recognized.

Research, experiments, years of usage in the oil fields of the world with strength, rigidity, minimum number of parts, tested design, skilled workmanship, complete protection against rust, fire, wind and corrosion, and a variety of sizes and weights for every drilling requirement, have been combined by International to produce oil derricks of the greatest working efficiency.

IDECO derricks not only offer you the greatest protection against fires, hurricanes, and other disasters, but also years of continuous use long after they have been charged off the books.

Have Never Been Successfully Imitated

Write for Catalog of Derricks and Buildings

NATIONAL DERRICK & EQUIPMENT COMPANY

OHIO **LOS ANGELES, CAL.**

New York, N. Y.; Detroit, Michigan; Dallas, Fort Worth, San Antonio, Houston, Mexia, Wichita Falls, Pyote, Borger, Corsicana, Pampa, Panhandle, Big Spring, Trent, Orange, Hebbronville, Texas; Shreveport, Oil City, Dorado, Smackover, Arkansas; Wichita, El Dorado, Valley Center, Kansas; Tulsa, Oklahoma City, Tonkawa, Seminole, Allen, Sasakwa, Maud, Wewoka, Oklahoma; Los Angeles, Torrance, Bakersfield, Taft, California;

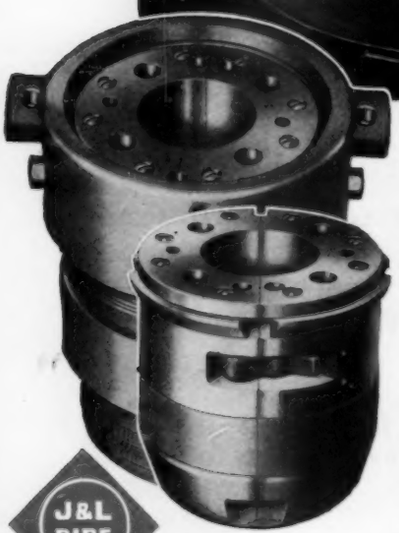
74 Trinity Place, New York City; Columbus, Ohio; Houston, Texas; Los Angeles, California. 505-A

Now --

a *faster* Blowout Preventer

. . . Built for Santa Fe Springs

where warning comes split seconds before disaster!



THOUSANDS of Baash-Ross Hosmer Blowout Preventers have given dependable protection for years in oil fields all over the world.

But Santa Fe Springs demands a *swifter*, more *automatic* defense against tremendous pressures than the industry has ever needed before!

Here it is—already safeguarding many of the field's wildest wells!

In the cellar, mounted on the casing, is the forged steel preventer body and lip ring. Over the derrick floor the packing assembly is hung—*complete*, rings in place, no additional parts required.

At the first ominous rumble—a swing, a snap, and the packing assembly slides down the drill pipe, clicks home under the lip ring—set a tool joint or collar down on it, or tighten the lip ring—the well is sealed—safely, permanently! And all in a split second!

J&L PIPE B-R

BAASH-ROSS TOOL COMPANY

General Offices and Plant 5512 Boyle Avenue
Box 1110 Arcade Station, Los Angeles

District Offices: Houston, *1816 Nance St.*—Tulsa, *International Supply Company* and *Lucey Products Corporation*—Export Office, *30 Church Street, N. Y.*

Field Shops equipped for 24-hour supply and mechanical service at Long Beach . . . Brea . . . Ventura . . . Taft

Oil Weekly, March 22, 1929

Baash-Ross Tool Company,
Box 1110 Arcade Station, Los Angeles

Gentlemen: Please send, without charge, Bulletin 8a describing the Hosmer *Automatic* Blowout Preventer.

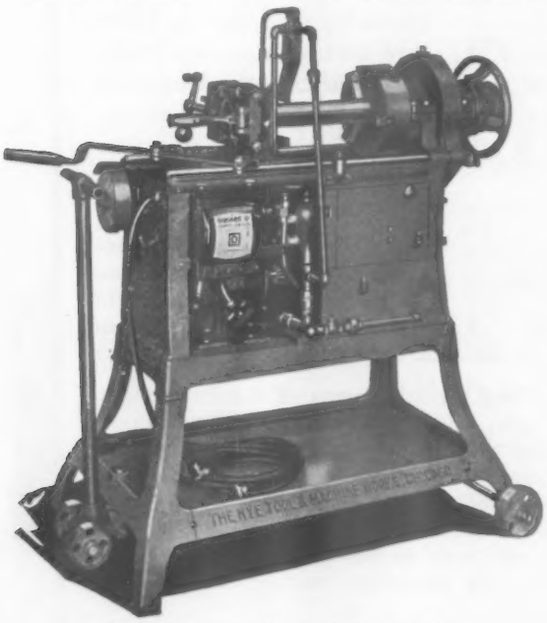
Name_____

Company_____

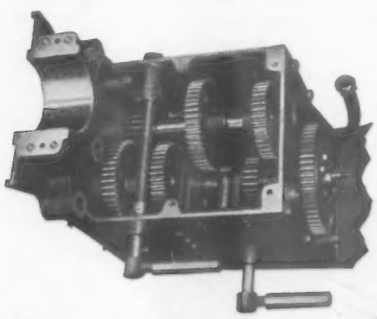
Address_____

A Letter from Harry G. Nye

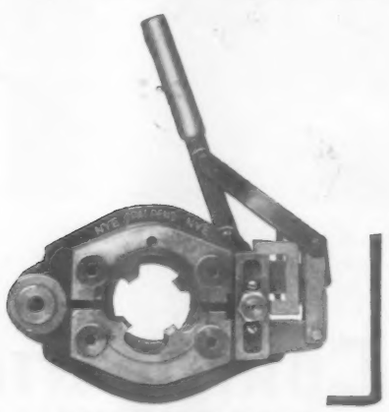
NYE POWER MACHINES
ALL GEAR DRIVEN—NO BELTS OR CHAINS



No. 100—capacity ¼ to 2 inches inclusive
No. 200—capacity ¼ to 2½ inches inclusive



Gear Case running in oil, assuring perfect lubrication.



QUICK OPENING DIE HEAD
Equipped With Trouble Proof Ring Type Dies
(No Chasers)

TO THE OIL MEN OF THE U. S. A.

Fellow Citizens:

I see where Prof. Burges Johnson, of Syracuse University, says we need some new cusswords. The professor must have been buying the wrong kind of pipe-tools.

Anyway, he says that every type of profanity we now use has become decadent, worn out, and without vital force, whatever that means.

What the professor means is that our cusswords haven't any kick to them. No wonder they are worn out, used as much as they are. We are as used to them as a mule.

Words that weren't mailable a few years ago now are even femaleable. A show isn't worth seeing if it is fit to hear. They say things in a novel now for which a man used to be thrown out of a saloon.

About the only magazine a man dast bring home is the Police Gazette or some oil journal. And a co-ed can out-cuss a cop. Not only can, but frequently does.

But, now that our very best people swear, what are our very worst people to do? Well, that doesn't bother us oil men.

Although we are the very best people ourselves, cussing has become a lost art, as far as we are concerned. Nye Tools have made cussing unnecessary, they work so fast and easy.

In spite of what the professor says, what we need isn't more cusswords, but more people who use Nye Tools. Then they wouldn't need to cuss.

Let them get up some new cusswords if they want to. I care not who makes the cusswords of my country, if I can make its pipe-tools.

Faithfully yours,

HARRY G. NYE.

Otherwise Known As

THE NYE TOOL & MACHINE WORKS

4120-30 Fullerton Avenue

Chicago, Ill.

Copyright 1929, Harry G. Nye, all rights reserved.

Universal Shaft operating stocks up to 12 inches

Manufactured by

THE NYE TOOL & MACHINE WORKS

4120-4130 FULLERTON AVENUE,

CHICAGO, ILL.

Identify by
JONES & LAUGHLIN
on every joint.

J&L PIPE

Field Performance Proves Quality of J&L Seamless

Exceptional performance of J & L Seamless in the every day work of the oil regions backs up our claims of its unsurpassed quality and unvarying dependability. These characteristics are the direct result of J & L's ownership-control of every step in manufacture and nearly 80 years' experience in steel making.

Oil and Gas men, after using our Seamless Steel Casing under every operating condition, pass the word along that "there's no better seamless made than J & L."

J&L STEEL

"Our Hat is Off to J&L Seamless"

Read the following story from the oil fields. It was written by Bob Speck, Covington, Okla., store manager, to the Tulsa office of the Frick-Reid Supply Corporation, J & L Pipe distributors. The story, just as it was received, reads as follows:

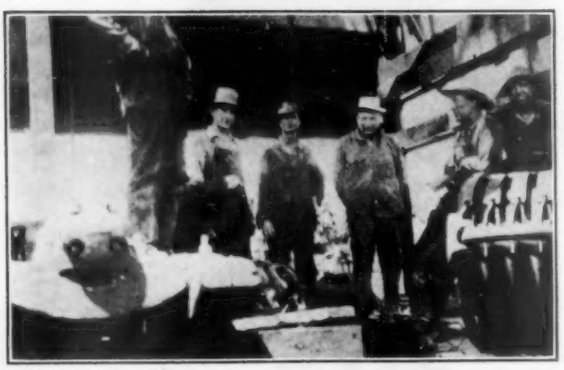
"Tell this one to the Grass Root boys.

"On Friday, July 13th, Wirt-Franklin Petroleum Corporation finished running a 6098 foot string of 6⅝" 26-lb. J & L Seamless Casing in their No. 1 Knecht in Sec. 21-18-4W, Logan County, Oklahoma.

"Compiling the statements of the Farm Boss, Addie Cope, and Harry Franklin, Tool Pusher, we find that in running 230 joints which averaged approximately 26' 6" to the joint, there was not a wobble or a bobble from the top to the bottom, not a defective thread, not a joint that did not 'stab' perfectly the first time, and, as a whole, 'the smoothest running casing job we ever saw.'

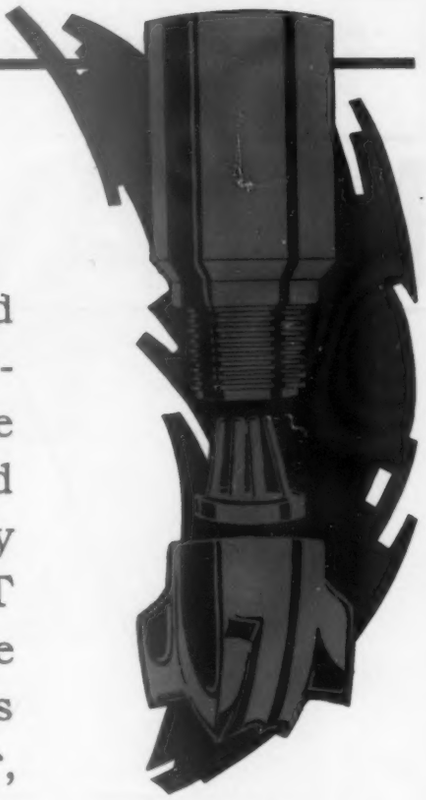
"The writer timed the crew for about an hour and found they averaged a little better than two joints every five minutes, starting all joints with chain tongs and finishing up with rotary tongs off the cat head on the rotary.

" OUR HAT IS OFF TO J & L SEAMLESS CASING."



Members of the crew on the Wirt-Franklin job described in the letter reprinted above.

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH PENNSYLVANIA



HAVING pioneered and developed oil well coring to its present state of high efficiency and dependability, it is only natural that ELLIOTT also has produced core drills that are miles ahead in efficiency, dependability, and low cost per foot of core recovered

Ask our nearest office for complete information covering Elliott Rotary and Cable Tool Core Drills. There is no obligation.

ELLIOTT CORE DRILLING CO.
850 Subway Terminal Building
LOS ANGELES, CALIFORNIA

BRANCHES:
3210 Harrisburg Blvd., Houston Texas
15 So. Madison St., Tulsa, Okla.
618 Lake St., Shreveport, La.
104 Brien St., Beaumont, Texas
417 S. Washington Street,
ElDorado, Arkansas
Export Office: 150 Broadway, New York

Elliott

ROTARY *and* CABLE TOOL

core drills

Say you saw it in The OIL WEEKLY

HEAVY DUTY

3½ TON

The Wichita Oil Field Special!

Built for oil field use —to stand every abuse.

Send for catalog that describes the Wichita Truck in detail.

Rough country, ditches, mud and the elements do not stand in the way of the Wichita Oil Field Special when there is work to be done. Wherever a well goes down, you can depend upon the Wichita to reach the spot with equipment and supplies in all weather.

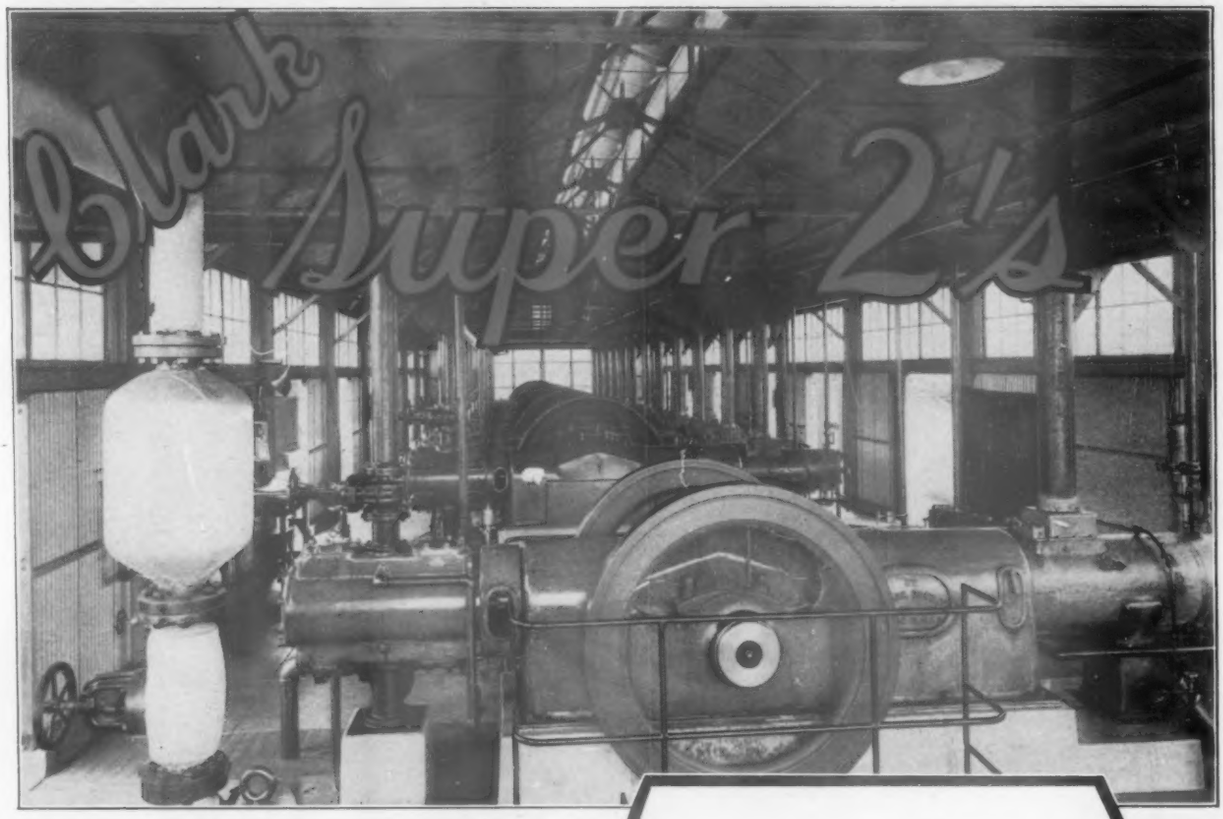
Designed to endure the severest treatment and for heavy duty use, the Wichita stands up under every job.

Built in the oil field country by a company that has spent nineteen years in manufacturing an oil field truck exclusively.

The Wichita Falls Motor Company

J. A. Kemp, *President*—Wichita Falls, Texas

Say you saw it in The OIL WEEKLY



Expand net Profits

Compressors and Gas Engines

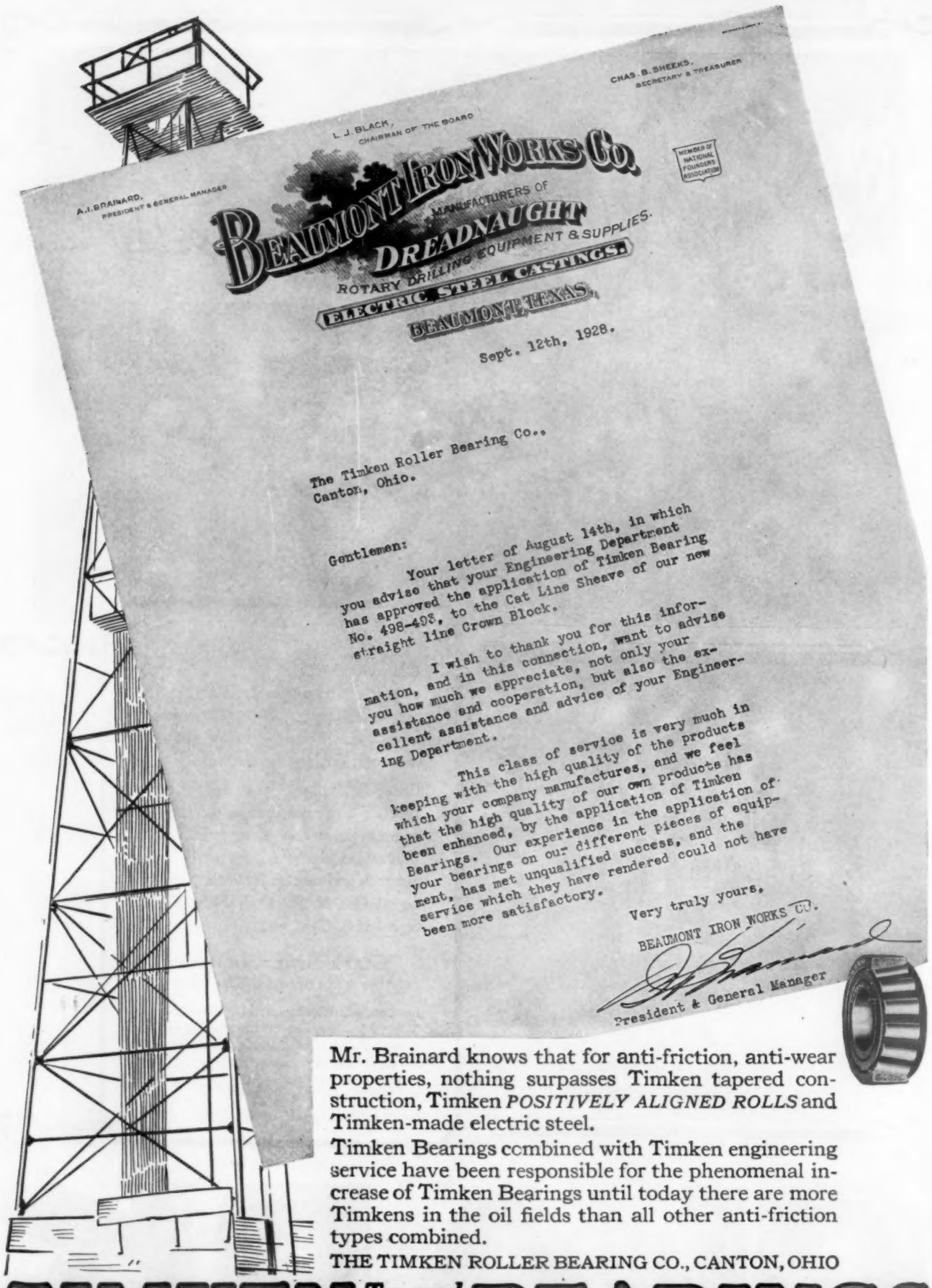
CLARK "Super 2s" have true 2-cycle simplicity and durability, yet they use one-third less gas than the ordinary 2-cycle compressor—no more than the most efficient 4-cycle machine.

Quite naturally a large and growing number of operators are using these compressors to expand net profits. The illustration shows six 180 H. P. Twin Super 2s and one 90 H. P. single in the Signal Gas & Oil Co.'s Plant No. 8, Signal Hill, Calif.

Clark Bros. Company
Olean, N. Y.

Branches and Warehouses: 125 West First St., Tulsa; McCamey and Sweetwater, Texas; and Artesia, N. M. Smith, Booth, Usher Company 228 S. Central Ave., Los Angeles, and 50 Fremont St., San Francisco.

CLARK


L. J. BLACK,
CHAIRMAN OF THE BOARD
CHAS. B. SHEEKS,
SECRETARY & TREASURER
A. J. BRAINARD,
PRESIDENT & GENERAL MANAGER
BEAUMONT IRON WORKS CO.
MANUFACTURERS OF
DREADNAUGHT
ROTARY DRILLING EQUIPMENT & SUPPLIES.
ELECTRIC STEEL CASTINGS.
BEAUMONT, TEXAS.
MEMBER OF NATIONAL FOUNDERS ASSOCIATION
Sept. 12th, 1928.
The Timken Roller Bearing Co.,
Canton, Ohio.
Gentlemen:
Your letter of August 14th, in which you advise that your Engineering Department has approved the application of Timken Bearing No. 498-493, to the Cat Line Sheave of our new straight line Crown Block.
I wish to thank you for this information, and in this connection, want to advise you how much we appreciate, not only your assistance and cooperation, but also the excellent assistance and advice of your Engineering Department.
This class of service is very much in keeping with the high quality of the products which your company manufactures, and we feel that the high quality of our own products has been enhanced, by the application of Timken Bearings. Our experience in the application of your bearings on our different pieces of equipment, has met unqualified success, and the service which they have rendered could not have been more satisfactory.
Very truly yours,
BEAUMONT IRON WORKS CO.
President & General Manager

Mr. Brainard knows that for anti-friction, anti-wear properties, nothing surpasses Timken tapered construction, Timken *POSITIVELY ALIGNED ROLLS* and Timken-made electric steel.

Timken Bearings combined with Timken engineering service have been responsible for the phenomenal increase of Timken Bearings until today there are more Timkens in the oil fields than all other anti-friction types combined.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN *Tapered Roller* BEARINGS

Say you saw it in The OIL WEEKLY

Seamless

CASING

TUBING

DRILL PIPE
{Regular and Heat Treated}

LINE PIPE

STILL TUBES

Sizes 2 inch to 13⅜ inch O. D.

Welded

CASING

STANDARD PIPE

LARGE O. D. PIPE

LINE PIPE

DRIVE PIPE

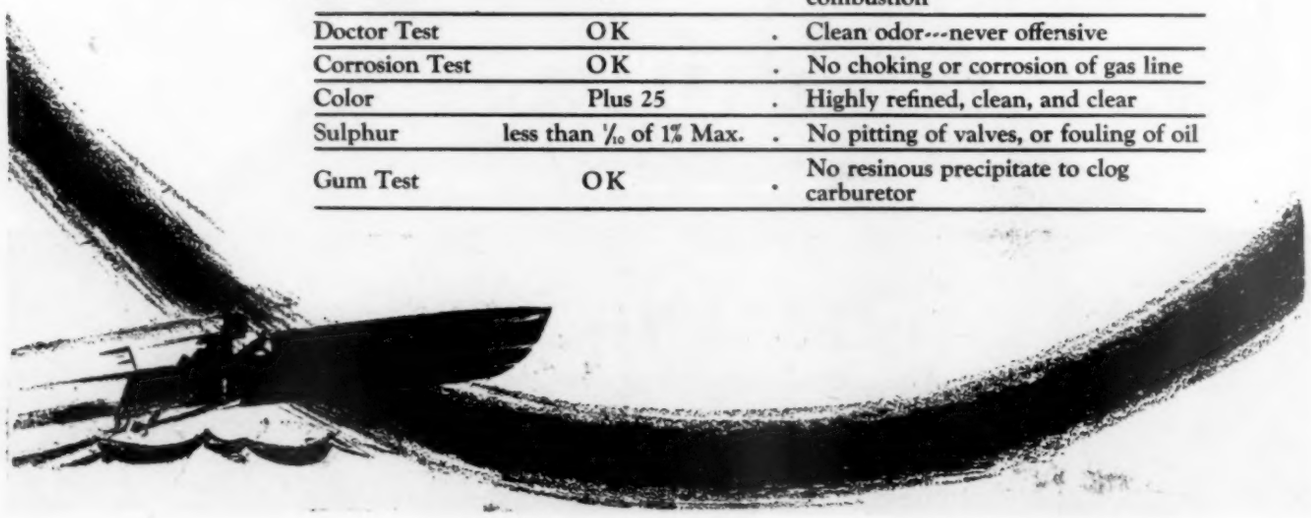
DRILL PIPE

Sizes ⅛ inch to 24 inch O. D.

ETNA

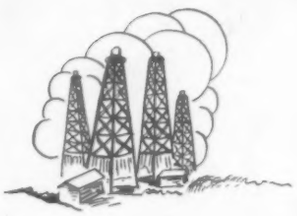
SPECIFICATIONS

LABORATORY ANALYSIS		WHAT IT MEANS TO YOUR MOTOR
Initial Boiling Point	110 Maximum	Easy starting---First in the get-away---No sputtering
% distilled at 221° Fahr. % distilled at 284° Fahr. % recovery	25 Minimum 52 Minimum 97%	More power, long burning stroke, less gear shifting
End Point	400	Complete vaporization---complete combustion
Doctor Test	OK	Clean odor---never offensive
Corrosion Test	OK	No choking or corrosion of gas line
Color	Plus 25	Highly refined, clean, and clear
Sulphur	less than 1/10 of 1% Max.	No pitting of valves, or fouling of oil
Gum Test	OK	No resinous precipitate to clog carburetor

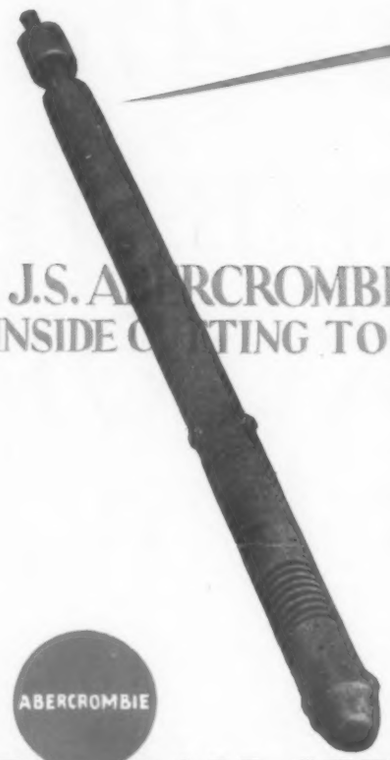


Say you saw it in The OIL WEEKLY

DEPENDABLE



PERFORMANCE ASSURES SATISFACTORY RESULTS



J.S. ABERCROMBIE
INSIDE CUTTING TOOL

When the J. S. Abercrombie Inside Cutting Tool, in charge of an Abercrombie service man goes into a hole to cut out liner and screen, or to salvage old casing, or fishing jobs, you may be sure the job will be done to your satisfaction.

In our many years of cutting out wells we have never failed to make a satisfactory completion on any job we started. The Inside Cutting Tools are properly designed and constructed and the men who have charge of them are thoroughly experienced in cutting out wells. The combination is a dependable unit delivering satisfactory results, to all who have cutting, salvaging, or deepening of wells to do.

When deeper sands are wanted, when there is a salvaging or fishing job to do call an Abercrombie service man with inside cutting tools.

ABERCROMBIE

RED BALL SERVICE

Long Distance 200 — Fairfax 5317

Twelve skilled operators,—all practical drillers with years of cutting experience are ready to start serving you at your command.

Abercrombie Tools are made in all sizes—specify inside diameter of casing when ordering our services.

J. S. ABERCROMBIE Co.
616-18 West Bldg. Houston, Texas

Years ago Halliburton undertook the serious responsibility of making available to the oil industry the advantages of an epochal improvement in the process of oil well cementing. Has it discharged its obligation well? A study of the "impossible" tasks Halliburton men have accomplished as part of their everyday work; a glance at the costly cementing outfits kept always ready for action, and a study of the six-figure sums spent in development and research, tell the answer more eloquently than volumes!

HALLIBURTON
OIL WELL CEMENTING COMPANY
DUNCAN, OKLAHOMA

Say you saw it in The OIL WEEKLY

There are more Wilson Elevators in service than any other make — in many fields almost 100% of the wells are *Wilson* equipped

First in
Safety
Speed
Strength
Convenience

Wilson
double extra heavy
side-door
Speed
Elevator

IT'S A WILSON

Succeeding WILSON & WILLARD MFG. CO.

WILSON OIL TOOLS CORP.

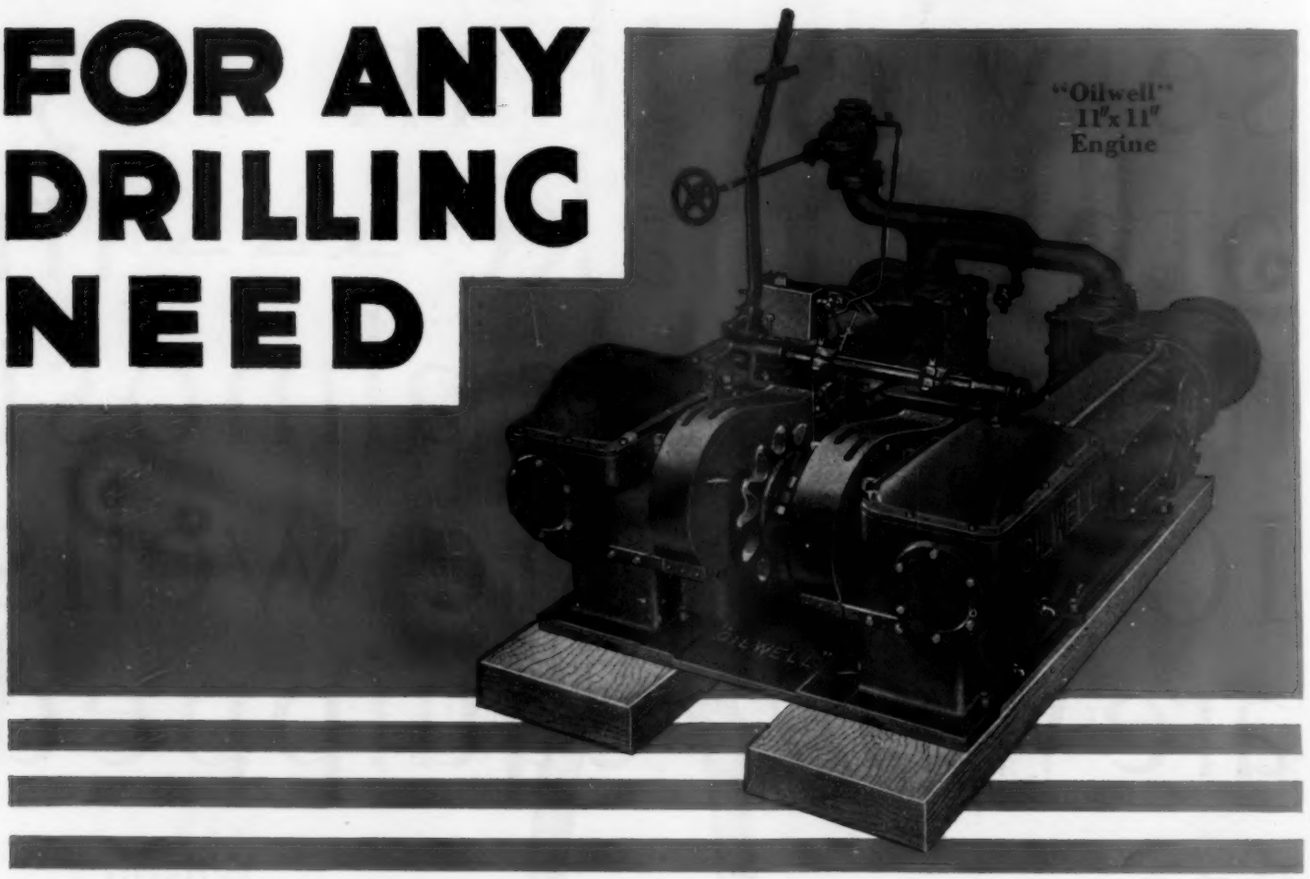
OIL TOOLS DIVISION
of
Byron-Jackson, Inc.

2301 E. Vernon Avenue, Los Angeles, California

Products—Elevators, Tongs, Underreamers, Circulating Heads, Rotary Drives, Bushings, Pistons and Valves for Slush Pumps, Slotted Screen Pipe

Factory Representatives:
Tulsa, Okla: 214 East Brady St.
Houston, Texas: 2201 Breckenridge St.
Fort Worth, Texas: 814 Dan Waggoner Bldg.
New York, N. Y.: 1245 Graybar Bldg.

PLENTY OF POWER FOR ANY DRILLING NEED



The smooth and steady application of power in this "Oilwell" engine, reduces vibration, decreases maintenance and increases durability. Less shock and strain is transmitted to the hoist and rotary, thereby reducing depreciation on this equipment.

Being of the enclosed type, constant and thorough lubrication is assured at all times and the engine can be operated without protection from the weather. The arrangement of covers for enclosing this engine permits easy inspection of working parts and at the same time safeguards the operator from accident.

"Oilwell" also makes a 12"x12" fully enclosed Twin Cylinder Engine as well as the 11"x11" and 12"x12" Single Cylinder Drilling Engine.

902

OIL WELL SUPPLY CO.

NEW YORK—LOS ANGELES—PITTSBURGH, U.S.A.—SAN FRANCISCO—TAMPICO—LONDON

WORLD'S OLDEST AND LARGEST MANUFACTURERS OF OIL FIELD EQUIPMENT

Say you saw it in The OIL WEEKLY

MAR 25 1929

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Volume 53, No. 1 *March 22, 1929*

The OIL WEEKLY

A GULF PUBLISHING COMPANY PUBLICATION

TABLE OF CONTENTS, PAGE 41 ADVERTISERS' INDEX PAGE 130

Limitation of Crude Output Up to Regional Committees

A. P. I. General Conservation Committee recommends holding world production in 1929 to 1928 recovery

By **WALLACE DAVIS**
Staff Representative

HOUSTON.—The first official international move to control crude production through a cooperative program within the industry will be launched, effective April 1, if the American Petroleum Institute board sees fit, between now and March 27, to accept plans proposed by that organization's general committee in Houston, March 15-16.

The proposed plan, insofar as the general conservation committee is concerned, is brief—to limit the current year's crude output to that of 1928. The task of working out details on this curtailment has been handed down to the four regional committees appointed at the institute's executive meeting in St. Louis a month ago. Each region's overproduction situation is to be handled according to problems peculiar to that territory.

Little doubt exists but that the Institute's board will favor the plan when it convenes in New York City, March 27. There is no objection in sight, at least any closer than problems that are to be encountered in the field when the working plan actually starts rolling. Even those problems met by proration programs of the recent past should be more feasibly overcome now that the territorial spirit behind conservation has taken on world-wide proportions. The Institute board is not likely to interfere with a progressive program which it was instrumental in inaugurating. Moreover, favoring success of the proposed plan is the fact that the Institute's president is one of the strongest proponents of conservation in the industry. At Houston, E. B. Reeser saw the first real fruits of his early efforts at world-wide proration on which he drummed loudly in New York more than a year ago when he worked in no official capacity, but merely as an operator, to arouse international spirit favoring some means of curbing the apparently hazardous production situation.

Permanent Plans

Decision was gained at the Houston meeting to effect a permanent organization on conservation following recommendation of such by the American Petroleum Institute. The plan calls for the setting up of permanent machinery in the form of a number of committees to give careful study to all phases of the conservation movement, not only in the manner of production but in the manner of proper use of petroleum products and comprehending within this study, not only the regions represented, but the entire world. Recommendations on this permanent organization will also be submitted to the board of directors of the institute at the March 27 meeting.

Completeness of conservation plans as worked out at the Houston meeting is seen in the thorough manner in which the general committee's recommendations are to be handled. Upon approval of the program by the American Petroleum Institute board it will immediately be submitted to the Federal Oil Conservation Board for approval. If favorable action is taken on the plan there, conservation authorities in the principal oil producing states are to be advised of the proposed action.

Of valuable significance at the Houston meeting is the cooperative interest shown by government officials and agents, both federal and state. The opinions of seven such representatives who were specially invited guests played an important part in the meeting, and is indicative of the interest the government is showing in the conservation movement. Cooperation by the state and federal government with the institute and the operators was heartily promised by the representatives. Conserva-

Hoover's Oil Land Policy Meets Protest

Casper, Wyo.—President Hoover's announcement that there will be no more oil and gas permits issued on public domain, that all pending permits will not be allowed, and that all existing permits on which no work has been done will be canceled, is meeting with a storm of protest from oil men in all sections of the public lands states, in the Rocky Mountain region. It is expected that a meeting of the Rocky Mountain Oil & Gas Association will be called soon to discuss the new policy announced by President Hoover and Secretary Wilbur. A brief will be prepared setting forth the operators' views and it is possible that someone representing the industry, or perhaps a committee, will be sent from the association to Washington to present to the Department of the Interior and the president.

THE GENERAL CONSERVATION COMMITTEE IN SESSION

From left to right, those in the photo are: Standing—R. W.McIlvain, J. A. Brown, A. L. Watts, Axtell Byles, J. W. Stewart, Roy B. Jones, W. C. Franklin, B. H. Stevens, W. S. Farish, W. N. Davis, Lee Jones, R. H. St. Clair. Seated—Richard Airey, Leroy Sadler, F. R. Coates, R. C. Holmes, E. B. Reeser, K. R. Kingsbury, W. R. Boyd, Jr.

Lower picture includes state officials and visitors attending the sessions in Houston

—Photos by Gibson, Chronicle Staff Photographer

Resolution Puts It Up to Board and Regional Committees

THE A. P. I. general committee on conservation, after discussing reports heard from regional committees at the Houston meeting, March 15-16, adopted the following resolution for presentation before the institute's board in New York City, March 27:

"Whereas, the Federal Oil Conservation Board has repeatedly called the attention of the country to the overproduction of crude oil and the consequent waste of this irreplaceable national resource, and has repeatedly invited the industry to cooperate with governmental agencies in improving the situation and has said, 'the complete organization of cooperative effort is recommended, with simple but effective working units that will insure full contact of the industry with both state and federal government and continuous contact of all operators in an oil field'; and

"Whereas, the state authorities of the principal oil producing states have exhibited a keen interest in the subject and a desire to have the cooperation of the industry in formulating and carrying on an effective program;

"Therefore, be it resolved that the production of the four regional areas represented by the committees will be sufficient for 1929 to meet the consuming requirements of the territories which they supply if the 1928 basis of production be adopted.

"Be it further resolved that beginning April 1, 1929, the average production of the four regions on a daily basis should not exceed the average daily production during the year 1928, and that each regional committee be requested to meet, either through its elective representatives on the general committee, or as a whole, with the general committee in New York, at the institute, on the morning of the 27th at 9:00 o'clock to report to the general committee whether or not the production in the respective regions can be brought to the 1928 average for that region.

"Be it further resolved, that in the event of favorable reports and the approval of the institute, that the action be at once submitted to the Federal Oil Conservation Board for its approval, and if approved by the Federal Oil Conservation Board, that the state authorities in the principal oil producing states be at once advised of the proposed action which shall become effective as the policy and program of the institute if approved by such state authorities."

tion officials who attended the meeting as invited guests included:

Dr. George Otis Smith, Washington, chairman, Advisory Committee of the Federal Oil Conservation Board; director, United States Geological Survey.

Clarence E. Gilmore, Austin, chairman, Railroad Commission of Texas.

C. V. Terrell, Austin, Railroad Commission of Texas.

Goodson Rieger, Austin, deputy supervisor, Railroad Commission of Texas.

Fred Capshaw, Oklahoma City, chairman, State Corporation Commission of Oklahoma.

W. J. Armstrong, Oklahoma City, State Conservation Officer of Oklahoma.

R. D. Bush, San Francisco, State Oil and Gas Supervisor, California State mining bureau.

March 1 Production

Work to be undertaken by the four regional committees on holding production for the ensuing year to the 1928 yield naturally will depend on the present status of production in the respective regions. Taking March 1 production as a working point (production at near that date having reached the peak yield for all time) it is seen that United States fields must be reduced approximately 237,000 barrels in daily average and held for the coming 12 months to effect the institute's goal. Success in curbing the daily output to this extent would give this country roundly 900,364,000 barrels crude recovery for the year in question, that figure having been the yield for 1928. In effect, it will require cutting the daily output of around March 1 from 2,703,000 barrels to the daily average yield in 1928, which was 2,466,750 barrels.

Oklahoma, one of the four market breaking areas, promises to be a minor problem for conservation, taking recent production performance as a criterion. By virtue of that state's recent decline from proration measures already established, coupled with the probable removal of the Oklahoma City and Mission fields from the disturbing class due to natural weaknesses, little overproduction was in evidence. While Oklahoma's daily output near March 1 approximated 713,000 barrels as compared with the 1928 daily average of 683,700 barrels, this amount of overproduction was believed wiped out at the middle of March.

Venezuela, now held up as the only major class foreign problem, must be cut 28 per cent., according to the findings of the general committee. That only 290,410 barrels, the 1928 daily average production of Venezuela, be maintained through the coming year it will be necessary to slice approximately 113,000 from present recovery. The checking of this South American flood of crude, however, does not stand out as any great problem. Control of productive acreage in Venezuela is held practically by a few major concerns, and the concensus of opinion at the Houston meeting was that the Venezuelan curtailment problem would be one of the easiest of the four regions. Proration actually in working order in that country now is capable of getting overproduction in shape almost immediately.

It is found that California's share of curtailment will amount to 18 per cent., or a cut of 167,000 barrels from the daily yield held on March 1. California's average per day during 1928 was 635,540 barrels. Proration work recently starting in major California fields, as Santa Fe Springs, was reported at the Houston meeting as having already begun to get interesting results. The work of the California regional committee started immediately following definite plans of the general committee, and K. R. Kingsbury, California committee chairman, called a meeting of this committee for March 21 in Los Angeles. Action of the other three regional committees has not been announced at the close of the general committee meeting.

Texas fields produced an average of 703,800 barrels in 1928. This yield for the current year will mean considerable curtailment, March 1 figures on the state's total having approximated 782,000 barrels.

What Working Plan?

With the competitive element in Venezuela not so marked in detail as in domestic fields, especially in point of acreage holdings, it is believed feasible for simply an operators agreement to curtail on a percentage basis to work out equitably and to the advantage of all concerned. This may resemble much the practice followed for the past year in West Texas flush areas. West Texas' proration program has resulted unusually successful, and doubtless the same type of working arrangement will be continued, with State Railroad Commission allowance figures being reduced to fit the institute's program.

Tightening of the strings on drilling

EXTENT OF PROPOSED A. P. I. CURTAILMENT
(Barrels in round numbers)

	1928 Production	1928 Daily Average	March 1, 1929, Production	Daily average Cut necessary
United States	900,364,000	2,466,000	2,703,000	237,000
California	231,982,000	635,000	802,000	167,000
*Oklahoma	249,558,000	683,000	713,000	30,000
Texas	256,888,000	703,000	782,000	79,000
Venezuela	106,000,000	290,000	403,000	113,000

*Decrease by March 15 sufficient to make added curtailment unnecessary to meet A. P. I. plan.

activity has worked in individual cases in California in the past, and such a procedure is mentioned now for the heavy producing areas of that state to distribute its part of the world-wide conservation program. Curtailment of drilling operations has never been so seriously considered in Oklahoma and Texas as the pinching of production after well completions.

The fate of Oklahoma's Sunday shutdown plan stands at an interesting state. Curtailment through this means got a wide applause at the close of the first act, and looked like a panacea. A number of leading producers at the Houston meeting from the Mid-Continent hesitated to say much in favor of Sunday shutdown, and furthermore expressed themselves as being doubtful of its outcome to any appreciable good. Lack of entire cooperation on the part of producers apparently has caused no further benefit to crude curtailment by Sunday shutdown than the program has received. While it has been found natural from a producing standpoint that some sands will produce approximately double the day following a 24-hour shutdown, this is not the case in some fields nor in some conditions in any field. At any rate a number of leading Oklahoma producers are still sticking to the "No production on Sunday" plan, and its place among successful proration measures is yet undetermined.

One significant question raising interesting discussion and finding no definite conclusion at the meeting was that of trying to effect a straight average on production or rather maintaining a level comparable to seasonal demand. Study will be made further by the general committee on this question, although the regional groups will be allowed to arrive at a definite program on this as well as their general working program. It was figured that if a somewhat even level should be maintained through the coming year that July and August, peak consumption months, would see withdrawals from storage, while during the coming winter months a seasonal overproduction would be in evidence in the face of the year's demands. It is probable, assuming that the curtailment is successfully carried out, that larger allowances will be given the fields during the period of heaviest refinery demands.

Committee Members Attending Houston Conference

R. C. HOLMES, General Chairman, The Texas Company, New York

Representing Pacific Coast Regional Committee:

K. R. Kingsbury, Standard Oil Company of California, San Francisco.

L. P. St. Clair, Union Oil Company of California, Los Angeles.

G. Legh-Jones, Shell Oil Company, San Francisco.

Representing Interior Regional Committee:

W. C. Franklin, Tidal Oil Company, Tulsa.

B. H. Stephens, Magnolia Petroleum Company, Dallas.

Roy B. Jones, Panhandle Production & Refining Company, Wichita Falls.

W. N. Davis, Phillips Petroleum Company, Bartlesville.

Gulf and Atlantic Coast Regional Committee:

F. R. Coates, vice chairman, Henry L. Doherty & Company, New York.

Henry M. Dawes, Pure Oil Company, Chicago.

Axtell J. Byles, Tide Water Associated Oil Company, New York.

W. S. Farish, Humble Oil & Refining Company, Houston.

Mexican and Northern South America Regional Committee:

E. J. Sadler, Creole Petroleum Company, New York.

J. W. Stewart, Pan American Petroleum & Transportation Company, New York.

Richard Airey, Asiatic Petroleum Company, New York.

A. E. Watts, Sinclair Consolidated Oil Company, New York.

Others in Attendance Included:

B. A. Ames, The Texas Company, Oklahoma City.

C. B. Ames, vice-president. The Texas Company, New York.

R. L. Blaffer, Humble Oil & Refining Company, Houston.

Burdette Blue, vice-president, Indian Territory Illuminating Oil Company, Bartlesville.

W. R. Boyd, Jr., former vice-president, American Petroleum Institute, New York.

E. R. Brown, president, Magnolia Petroleum Company, Dallas.

J. A. Brown, General Petroleum Company, Los Angeles.

Roderic Crandall, Anadarko Western Oil Company, Tulsa.

F. V. Faulkner, vice-president, Magnolia Petroleum Company, Dallas.

Jas. W. Finley, Empire Gas & Fuel Company, Bartlesville.

C. H. Kountz, vice-president, Prairie Pipe Line Company, Independence.

John H. Lapham, The Texas Company, San Antonio.

Clarel B. Mapes, Mid-Continent Oil & Gas Association, Tulsa.

J. A. Moffett, vice-president, Standard Oil Company (New Jersey), New York.

E. H. Moore, Independent Oil & Gas Company, Tulsa.

R. Ogarrio, vice-president, The Texas Company, New York.

R. W. Pack, Sun Oil Company, Dallas.

J. Edgar Pew, vice-president, Sun Oil Company, Dallas.

Richard Pratt, Standard Oil Company (New Jersey), New York.

Wallace E. Pratt, Humble Oil & Refining Company, Houston.

E. B. Reeser, president, Barnsdall Oil Company, Tulsa.

J. M. Sands, Phillips Petroleum Company, Bartlesville.

W. A. Sinsheimer, H. L. Doherty & Company, New York.

J. W. Stewart, president, Lago Petroleum Company, New York.

T. E. Swigart, Shell Oil Company, Los Angeles.

Van Covern, American Petroleum Institute, New York.

Earl W. Wagy, Standard Oil Company of California, San Francisco.

W. B. Walker, Standard Oil Company of New York, New York.

H. C. Wiess, Humble Oil & Refining Company, Houston.

C. A. Young, American Petroleum Institute, Dallas.

Looking down the boundary line between the V. O. C. properties (on shore) and the Gulf's Rodriguez Lease (off shore), La Rosa-Ambrosio Field, Maracaibo District

Battle-Front Shifts *at* Maracaibo

By ROY E. LEIGH
Special Foreign Representative

MARACAIBO, Venezuela, March 2 (By Mail)—By a sudden shift of 12 or 14 drilling rigs from other fields into the La Rosa-Ambrosio district, the Shell group (Venezuelan Oil Concessions, Ltd.) has precipitated a line fight which promises to rival the historic offset campaigns which marked developments along the northeastern shore of Lake Maracaibo prior to the restriction of drilling, by mutual agreement, in April 1927. The race for light oil produced in this fertile area is so keen that competition extends even unto the second and third lines of wells paralleling each boundary line. In this district, the holdings of the Venezuelan Oil Concessions, Ltd., Venezuelan Gulf Oil Company and Lago Petroleum Company are in such close proximity that the commencement of new wells by one company generally forces each of the other two competitors to make offset locations immediately.

This maneuver, executed suddenly and in accordance with the best military tactics, is calculated to upset the balance of power, so to speak, among the three companies operating in this the second largest oil field in the Maracaibo Basin. It will give the Shell subsidiary a total of 20 rigs, almost twice as many as are available to its two American competitors, the Lago Petroleum Company (Standard Oil Company, Indiana) and Venezuela Gulf Oil Company. Venezuela Gulf Oil Company, operating on the Rodriguez parcel, one of several long rectangular strips situated within the [1]Marine Zone, has eight rigs employed in this highly competitive area, while the Standard Oil Company (Indiana) subsidiary, which controls the entire lake bed, has only three rigs operating in this vicinity.

Following the military analogy, it would appear that the Shell's tactics may be to concede the field to their rivals in the Lagunillas District, whence a number of drilling crews and rigs were transferred to the La Rosa-Ambrosia area. The positions of the British and American companies are reversed in the Lagunillas District, where both Venezuela Gulf Oil Company and the Lago Petroleum Company enjoy positions of supremacy, each having more rigs and greater production than the Shell subsidiary. Apparently sensing its inability to maintain a competitive position in both of these important districts, Venezuelan Oil Concessions, Ltd., is beginning to concentrate its efforts in that field which yields the [2]lighter oil.

The present positions of the three companies on these two active battle-fronts are approximately as follows:

Rigs in Operation—	Lagunilles	La Rosa-Ambrosio
Venezuelan Oil Concessions, Ltd., (Shell)..	2	20
Lago Petroleum Company (O. S.—Ind.) ..	14	3
Venezuelan Gulf Oil Company (Gulf Oil Corporation)	12	8
Daily Average Prod.—		
Venezuelan Oil Concessions, Ltd., ...65,000		49,000
Lago Petroleum Company 85,000		32,250
Venezuelan Gulf Oil Company 75,000		20,300

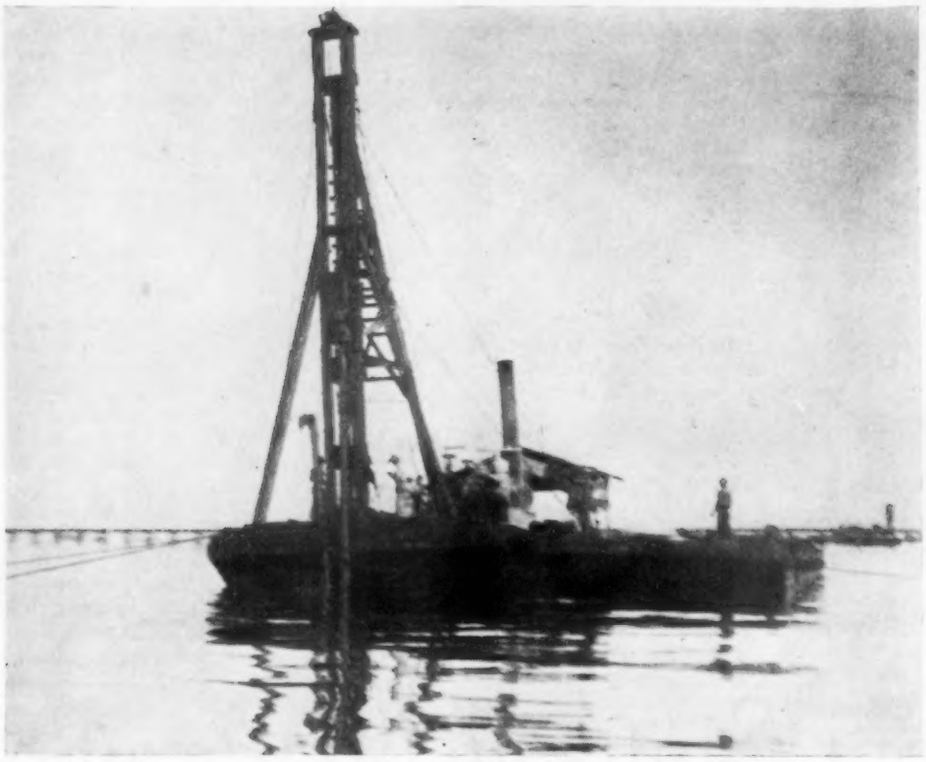
The reactions of Lago Petroleum Company and Venezuelan Gulf Oil Company are being awaited with the keenest interest. Except for the recent transfer by Lago Petroleum Company of one or two rigs into the La Rosa-Ambrosio District, there is as yet no indication as to what its plans of battle may be. It has been suggested that it may take full advantage of the Venezuelan Oil Concessions withdrawal from the Lagunillas field, where very satisfactory production is had from wells which have an initial flow of from 1,000 to 4,000 barrels of oil per day.

More Tankers

None of these developments, however, is expected to have any appreciable influence on the total production from the Maracaibo Basin, which is almost entirely controlled by the tanker capacities of the various operating com-

[1]The "Marine Zone" entirely surrounds the Maracaibo Lake, its outside boundary being the shore line and its inside boundary being a line paralleling the shore line at a distance of one kilometer offshore.

[2]Lagunillas crude ranges from 16° to 22° A. P. I., while the range in gravity of oil produced in the La Rosa-Ambrosio District is about five degrees higher.



Driving piles for a new location in the La Rosa-Ambrosio Field, Venezuela

panies. With [3] two entire fields shut in, and wells in other districts being pinched in drastically so as to keep their production within the refining, storage, and shipping capacities of the various companies, nothing but the development of additional tanker outlets or storage facilities can be expected to cause any substantial increase of the Basin's current output of around 375,000 barrels per day.

However, Venezuela Oil Concessions and Lago Petroleum Company each have [4] six new tankers on order, which will increase their shipping capacities by about 864,000 and 1,056,000 barrels per month, respectively, effective upon delivery of the ships, beginning about June 1, 1920. By speeding up the movements of its 19 tankers plying between Maracaibo and Aruba, D. W. I., Lago Petroleum Company was able during February to increase its shipping capacity from 2,772,000 to 3,044,000 barrels per month. Lago Petroleum Company operates 16 16,000-barrel tankers, on a schedule of 11 trips per month, and two smaller vessels of 6,000 and 4,500 barrels capacity which make only five trips each month.

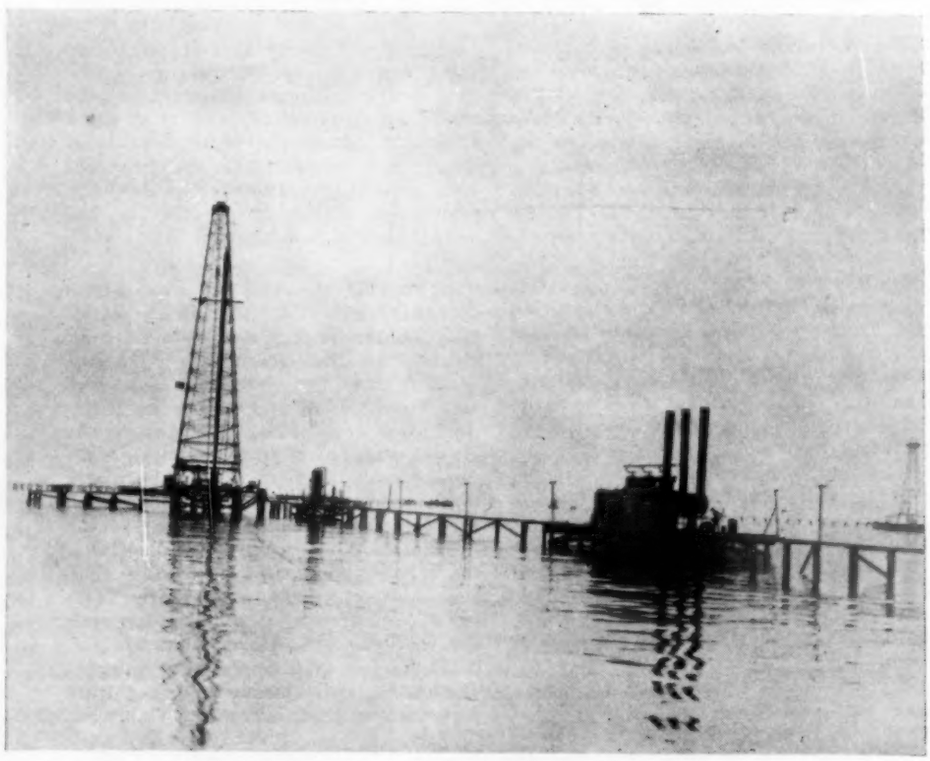
The Shell group operates a lake fleet of 36 vessels, including three of 15,500 barrels capacity each owned by the Arend (Eagle) Petroleum Maatschappiji, of Aruba. Of the other 33 ships, 29 can transport about 16,000 barrels each per trip, and the other two can handle only about 13,000 barrels each. The Shell fleet operates between Maracaibo and Curacao, D. W. I., on a schedule of nine round trips per month, and has a capacity of approximately 4,662,000 barrels per month. The Arend vessels make 10 trips per month to Aruba, which gives the Shell group an outlet for a total of approximately 5,127,000 barrels of oil per month.

Venezuela Gulf Oil Company operates a fleet of 18 tankers, plying between the Lagunillas and Ambrosio fields and the company's terminal on the Paraguana Peninsular (Venezuela), whence oil is shipped in ocean-going tankers to the Gulf refineries at Bayonne, New Jersey, and Philadelphia, Pennsylvania. The Gulf fleet operates on a schedule of 11 trips per month, and has a total capacity of 3,432,000 barrels during each such period. Venezuela Gulf Oil Company owns three 20,000-barrel ships and charters three others of similar size from the Creole Petroleum Corporation (Standard Oil Company of New Jersey). These six are the largest tankers on the lake. Eight of the Venezuela Oil Company's vessels are of 17,000 barrels capacity each, and the other four can move 14,000 each per trip.

Thus, the combined capacity of the three fleets (totalling 73 ships) lifting oil out of the Maracaibo Basin may be calculated as totalling 11,603,000 barrels per month, if operated on present schedules at 100 per cent. efficiency.

More Storage

Several of the companies, including the Creole Petroleum Corporation and



Scene of competition between Shell, Lago, and Gulf companies in the La Rosa-Ambrosio District, Maracaibo Basin, Venezuela

[3] The La Paz and Concepcion fields, controlled by Venezuelan Oil Concessions, Ltd., have remained shut in since June, 1927.

[4] Dispatches from ship-yards in Glasgow indicate that Lago Petroleum Company is receiving bids for the construction of 12 more tankers, in addition to the six vessels now on order.

the Colon Development Company (Shell) are engaged in the construction of additional storage facilities. The Lago Company is constructing extensive storage and refining facilities on the Dutch Island, Aruba, situated just off the Venezuelan coast, which are expected to be completed about the middle of the year. The completion of this 80,000-barrel refining plant, coinciding as is expected with the delivery of additional shallow draft tankers for moving oil out of Maracaibo Lake, may have an exhilarating effect on Venezuelan production, unless shut-down agreements should again be resorted to as a result of overproduction in the United States.

The production of crude oil from the Maracaibo District during 1928 showed an increase of approximately 68 per cent. over the record of the preceding year. In fact, such increases have been consistent since the exploitation of the Mene Grande field got well under way in 1920 and 1921. Production in 1924 exceeded that of the preceding year by about 139 per cent. followed by a pyramiding gain of nearly 125 per cent .in 1925. Increases since that date are partially reflected by the following tabulation of export statistics. Obviously, these figures do not include increasing quantities of oil placed in local storage constructed during recent years to handle oil produced in excess of shipping facilities.

[5]TOTAL PRODUCTION
Maracaibo District

Month	1927	1928
January	4,605,054	7,040,376
February	4,286,589	6,606,816
March	4,549,591	7,746,285
April	4,251,945	7,546,483
May	4,570,227	8,286,550
June	4,815,949	8,151,796
July	5,187,041	8,762,146
August	5,103,503	8,669,185
September	5,454,639	9,467,028
October	6,164,407	10,654,238
November	6,793,641	10,986,594
December	7,034,502	11,605,267
Total	62,817,088	105,522,764

[6]TOTAL EXPORTS OF CRUDE OIL FROM MARACAIBO BASIN

Month	1925	1926	1927	1928
Jan.	1,189,040	2,603,385	4,000,317	6,813,763
Feb.	1,327,020	2,263,600	3,779,953	6,340,521
Mar.	1,716,011	2,519,519	4,018,528	6,949,922
Apr.	1,588,156	2,584,890	3,760,248	7,271,047
May	1,265,241	2,934,186	3,913,962	7,763,924
June	1,077,829	2,699,508	3,864,239	8,066,396
July	1,115,413	2,762,427	4,237,773	8,557,256
Aug.	1,703,231	2,921,411	4,644,529	8,289,242
Sep.	1,398,818	2,754,889	5,069,044	8,482,260
Oct.	1,881,425	2,993,157	6,070,514	9,424,424
Nov.	2,219,241	3,129,540	6,049,335	9,876,695
Dec.	2,540,789	3,269,676	6,196,989	10,064,691
Tot.	19,022,214	33,473,644	55,605,431	97,900,141

[5]Statistics by C. C. McDermond, Maracaibo, Venezuela..

[6]Statistics by C. C. McDermond, Maracaibo, Venezuela.

[7]The La Paz and Concepcion fields were producing a total of approximately 4,000 barrels per day when operations were suspended in June, 1927.

Various authorities estimate that production in this fertile basin will range between 135 and 150 million barrels during 1929. Since Maracaibo production is at present governed by shipping, refining, and storage facilities, one might, by giving effect to additional outlets anticipated about mid-year, estimate that 1929 production will even exceed 150 million barrels; but such a calculation might easily be upset by any one of a number of different factors, such as overproduction in the United States, unfavorable market conditions, shut-down agreements, etc. In all such calculations, more attention must be given to extraneous factors than to local conditions. If shipping facilities and favorable market outlets were available, current production averages probably could be doubled in a very short time by an expansion of drilling activity and by opening up fields and wells now shut in or pinched in.

Gulf tanker loading oil at La Rosa Terminal, Maracaibo Lake, for shipment to Paraguana Peninsular (Venezuela) where it will be loaded into ocean-going tankers for movement to Philadelphia and Bayonne

No Limit to Possibilities

With [7]two fields shut in, and with wells in other fields pinched in to a small fraction of their potential production, there is almost no limit to Maracaibo's production possibilities. The entire eastern shore of the lake is expected to be productive, thus joining up the La Rosa, Ambrosio, Punta Benitez, and Lagunillas fields into one vast productive area extending far out into the bed of Maracaibo Lake. Indeed, future developments may include a southern extension of the Lagunillas field, where no dry holes have as yet been drilled, and where the limits of production are still wide open on all sides. As now developed, the field is about seven miles long by one and one half miles wide, with little or no indication as to how much farther it may extend in any direction. For the present, however, a southern extension of this field is precluded by mutual agreements in existence between the companies.

It is said that several of the crews now being transferred into the La Rosa-Ambrosio field are being loaned to Venezuelan Oil Concessions, Ltd., by the Caribbean Petroleum Company from the Mene Grande field, which is also controlled entirely by the Shell group. Thus, actively in the Mene Grande field is also likely to be restricted during the continuance of the competitive campaign at La Rosa-Ambrosio. The La Paz and Concepcion fields, situated a few miles west of the city of Maracaibo, and controlled by Venezuelan Oil Concessions, Ltd., have remained shut in since June, 1927, when the Shell Company shifted its crews and rigs into the more competitive fields along the eastern shore of the lake.

Production is had at depths ranging from 2,200 to 2,600 feet in the La Rosa-Ambrosio field. Two-string wells are the rule; and, the formations being soft, each rig averages about one completed well per month. These wells make from 500 to 4,000 barrels per day, initially; and, with 31 rigs operating at high speed, day and night, it is expected that the potential production from this competitive area may be increased by 30,000 or 40,000 barrels or more per day during each of the next three or four months.

There are now approximately 101 drilling operations in progress in the Republic of Venezuela, as follows:

SHELL GROUP—

Company—Field	Rigs	Total
Caribbean Petroleum Co.,		
Mene Grande	2	..
Venezuelan Oil Concessions		
La Rosa-Ambrosio	20	..
Lagunillas	2	..
Colon Development Company, Rio Tarra	6	..
Wildcats	2	32
Venezuela Gulf Oil Company, La Rosa-Ambrosio	8	..
Lagunillas	12	..
Wildcats	3	23
Lago Petroleum Company, La Rosa-Ambrosio	3	..
Lagunillas	14	17
Creole Petroleum Corp.,		
Totumo	4	..
Hombre Pintado	2	..
Wildcats, including Eastern Venezuela	5	11
British Controlled Oilfields, Ltd., El Mene	4	..
Wildcats	4	8
Richmond Petroleum Company, El Mamon	3	..
Wildcats	3	6
Orinoco Oil Company, (Pure Oil Company)	..	1
Union National Petroleum Corporation	..	1
Venezuelan Atlantic Refining Company	..	1
Sun Oil Company	..	1
Total		101

Kettleman Hills *High Pressure Area Proves Interesting* Development

By BRAD MILLS
Staff Representative

AFTER blowing wild for 20 days, Milham Exploration Company's Elliott 1 was brought under complete control October 26 and surprised the oil world in general by producing 4800 barrels of 60.6° gravity oil and more than 50 million cubic feet of gas. It required five gas traps to handle the flow. Even those who had long believed in the possibilities of Kettleman Hills were inclined to the theory that the well was a freak.

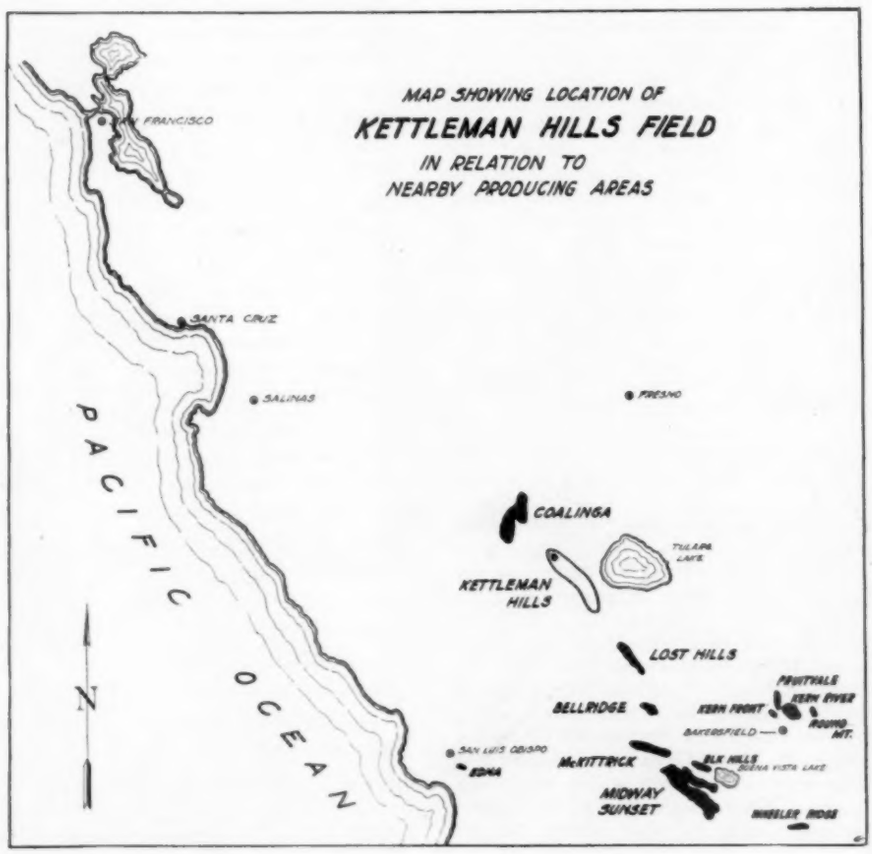
A rapid search failed to disclose that a similar well had ever been completed in any field during its 20 years exploitation. Estimates made when the well was blowing wild had not exceeded 1000 barrels, and samples of the oil caught in improvised containers showed a gravity of 45 degrees.

Day after day the well produced about 4500 barrels of 60.6 gravity oil, with all but the most optimistic waiting for production to cease from one cause or another. It did not. And after 60 days the companies started on a development program which may change the production center of California.

Method of Control

Incidents leading up to the blowout and devices used to bring the well under control should be of interest to producers, particularly those who may be called upon to drill under similar circumstances.

Elliott 1 was originally drilled to 7236 feet without trouble, yet the well blew out while re-drilling at only 7108 feet. It had been necessary to back up, sidetrack and re-drill for several hundred feet, after sticking the drill pipe at 7236 feet. It still remains a mystery why the well blew out from more than 100 feet above the old depth. The company believes that precautions taken in drilling the original hole were responsible for passing through the rich oil and gas sand without mishap and without the definite assurance that a producing formation was being cut. The mud had been charged with hematite and barrite and no trouble developed.



Although the same precaution was taken in re-drilling the well, the pressure was controlled and, little by little, the mud was blown out from around the drill pipe. The tendency to blow out usually develops when the drill pipe is being pulled from the hole, caused chiefly by the lowering of the fluid which has been displaced by the drill pipe. Elliott 1 blew out when the drill pipe was being run in, however, and when the hole was running over with mud. Undoubtedly the mud had been gradually thinned by forcing the drill pipe through it.

The theory that the re-drilled hole may have run into the original hole has been advanced, but such a condition may have not been responsible for production so high above the old bottom. The belief that the re-drilled hole is as deep stratigraphically as the old hole also has been advanced, but it would hardly be possible to weave around to such an extent in 1000 feet. If the re-drilled hole is producing in a regular manner, it seems safe to say that if the original hole had blown out from a greater depth, production would be much larger, and that larger wells will be completed from a greater body of sand.

Blow-Out Equipment

When the well blew out, 5000 feet of drill pipe was hanging in the hole. The 6¼-inch casing was open at the top, but was equipped with a flanged blowout head. The rush of the gas from the casing was so great that vibration prevented fitting another flange on from the top. After more than two weeks, a flared, flanged spool was bolted onto the blowout flange on the 6¼-inch casing. By flowing or enlarging the spool, the expansion of the gas caused much less vibration, allowing bolts to be inserted. The spool was also flanged on the top. A short joint of 15½-inch casing was flanged at the bottom to fit the top of the spool and attached to the spool after several unsuccessful attempts. Before the short joint of 15½-inch casing was fitted, a gate valve had been attached to the top, while two openings had been welded into the sides. After the casing or nipple was flanged onto the spool, the large gate valve at the top was closed, the smaller valves on the side outlets opened, and the oil went pouring into the tanks. The 15½-inch nipple was long

enough to slip over the drill pipe, which is now suspended in the hole.

Five large gas traps were installed, but it was found that best results could be obtained by using only four and allowing a part of the gas and oil to escape.

Milham Exploration Company's Elliott 1 was started March 21, 1927, and brought under control October 25, 1928. Actual drilling time was more than one year. Cost of the well is believed to have exceeded $300,000.

A 24-inch hole was started, in anticipation of a very deep producing sand. The first casing, aside from a surface conductor, was a string of 15½-inch, which was cemented around 2000 feet; 11-inch casing was set at about 4000 feet. The 6¼-inch casing was the last string run and was cemented at 6317 feet. The well is flowing from 800 feet of open hole.

View of Kettleman Hills Field

Character of Drilling

Formations above 5500 feet were not especially hard to cut, but at this point the trouble began. From 5550 feet to the bottom of both holes, reef beds were encountered. Most of this 1600 feet was flinty sand of extreme sharpness. It often took less than an hour to wear out a rotary bit, while during many days less than one foot of hole was made each 24 hours. The bulk of the time was required in running in and pulling ou of the hole.

Undismayed by failures, Milham Exploration Company finished Elliott 1, even if prematurely. Fishing jobs, the actual loss of several hundred feet of hole and almost every imaginable kind of mechanical trouble failed to shake their faith in the structure. That their award has been ample is shown by the return of the total cost of the well in a little more than three months.

Many millions of dollars have been spent and fully 30 wells had been drilled before important production was obtained in Kettleman Hills. The first well was started about 20 years ago, only to be abandoned in 1910, after reaching a depth of 4110 feet—then considered an achievement of a generation. Cable tools, rotary tools and combinations of both were used to no avail. Drilling technique improved rapidly during the 20 years of exploration and many wells drilled after 1920 passed 6000 feet.

Several companies believed in the huge structure and made futile attempts to reach the sand. Marland Oil Company geologized the district and was so favorably impressed that several permits were obtained and a well drilled to 5680 feet. Mechanical troubles caused the abandonment of the well soon after the extremely hard, flinty formation was encountered. The company retained much of its acreage and royalties in additional permits, leaving its position in the field very strong.

History of Development

General Petroleum Corporation has been one of the most persistent operators in the district, having drilled four wells during the past three years. One was abandoned after cutting thin streaks of oil sand and another suspended at 6750 feet. After the completion of the discovery well, drilling was resumed in Oeschner 2, although it was necessary to plug back, sidetrack and re-drill for several hundred feet.

Bolsa Chica Oil Company, Associated Oil Company, Miley Oil Company and others drilled without results on the north and middle domes.

Failure to obtain production above 6500 feet severely jolted the theory that a light oil should be found within reach of modern-day methods. The size of the structure long has been held against it, for the simple reason that it seemed improbable that an oil field in this district should extend for more than 30 miles, with a width in excess of five miles in places.

Kettleman Hills lie in the west edge of the San Joaquin Valley, between Tulare Basin and the Diablo range. They are isolated from the severer ranges on the west. They rise about 750 feet above the Kettleman Plain and are more than 1000 feet above the bed of the San Joaquin Valley. They describe a wide curve and stand out prominently above the surrounding plains. The huge structure apparently is divided into three domes, all possibly describing one huge anticline. Advantages of an anticlinal structure in California are many and usually offer greater possibilities than a monoclinal.

Pumps run by natural gas pressure in Kettleman Hills

Correlation with Coalinga

Extensive development in Coalinga field, lying only 12 miles northwest of the north dome, has made it possible to roughly segregate the formations in Kettleman Hills. At Coalinga, the paraffin oil are Upper Cretace-

(Continued on page 96)

Factors *in* Design *of* Portable Field Seismographs

By MARK C. MALAMPHY
Consulting Geophysicist

ALTHOUGH the seismograph is being used very extensively in the search for potential petroleum producing structures, there is very little published data available regarding the various factors entering in the design of suitable apparatus for this type of geophysical prospecting.

Generally speaking any seismograph is composed of three parts: 1. A base which is in contact with the earth and follows the movement of the earth caused by the seimic waves; 2. A mass suspended from this base by some type of spring. Due to inertia the mass tends to remain in its state of rest and does not follow the seismic wave; 3. Some means of recording the relative motion of these two parts.

Field seismographs may be divided into two general classes, depending on the method employed to record the relative motion of the component parts. These types are usually referred to as the mechanical and the electrical seismographs.

In the "mechanical" instrument, the relative motion of the mass, which may be either horizontal or vertical depending on the component which the instrument is designed to record, is translated by mechanical means into a rotary motion of a small shaft carrying a tiny mirror. A beam of light is reflected by this mirror on to a sensitized photographic paper or film which is moved through the camera in a direction perpendicular to the plane of movement of the beam of light. This film is driven through the camera, either by a hand crank or by electric or spring motor. The rate of motion of the film is determined by some type of time marks photographed on the record by means to be described hereafter. Figure 1 is a schematic drawing of one popular type of mechanical seismograph, with its auxiliary equipment.

In the electrical type of instrument, instead of the motion of the component parts of the seismoraph being recorded

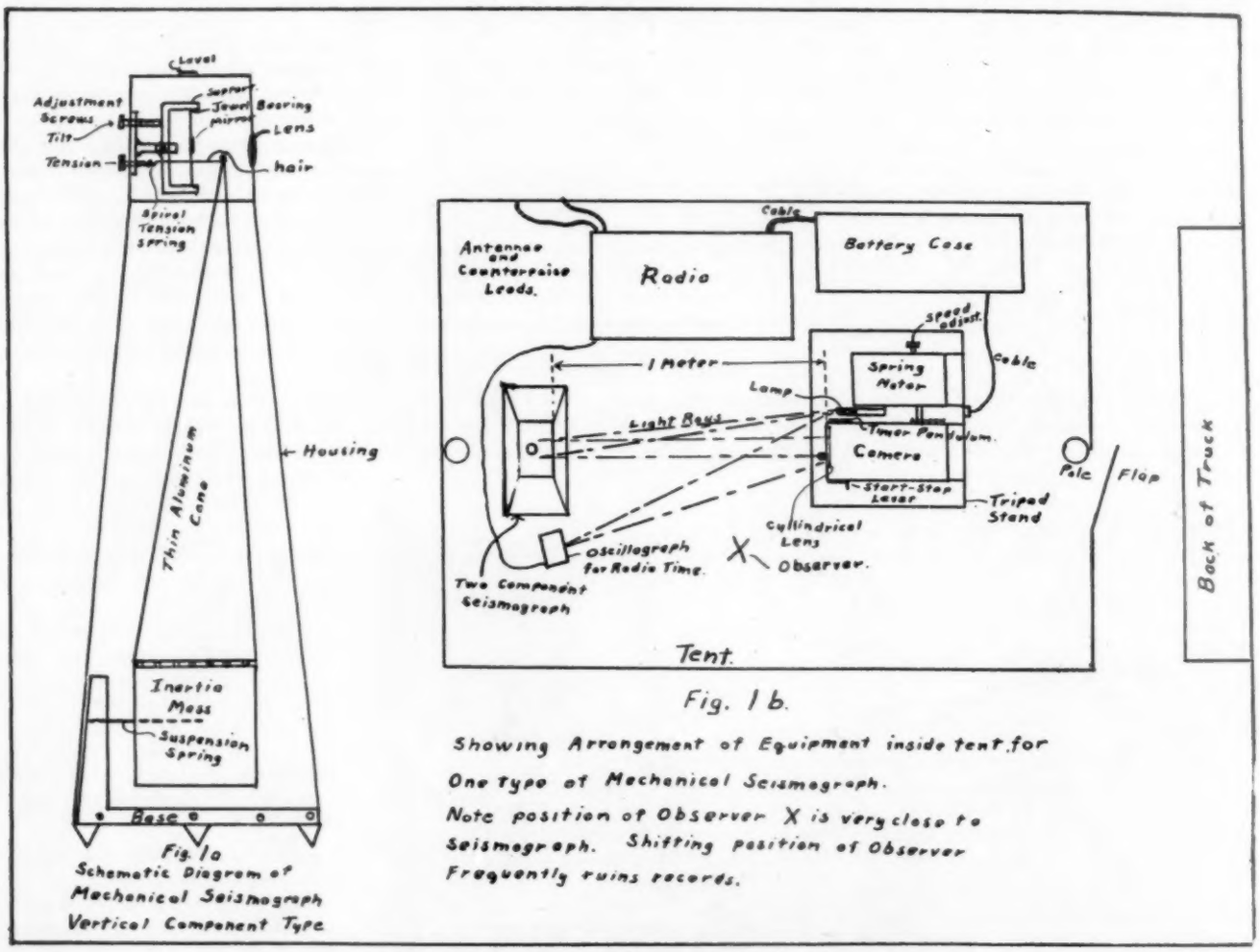


FIGURE 1—MECHANICAL SEISMOGRAPH

1a. *Sketch of one form of mechanical seismograph showing method of converting relative motion of case and inertia mass into a rotary motion of mirror. Note the hair which is connected with the top of the cone and which is given one turn around the mirror shaft.* 1b. *The usual arrangement of complete recording equipment inside the tent in preparation of taking record.*

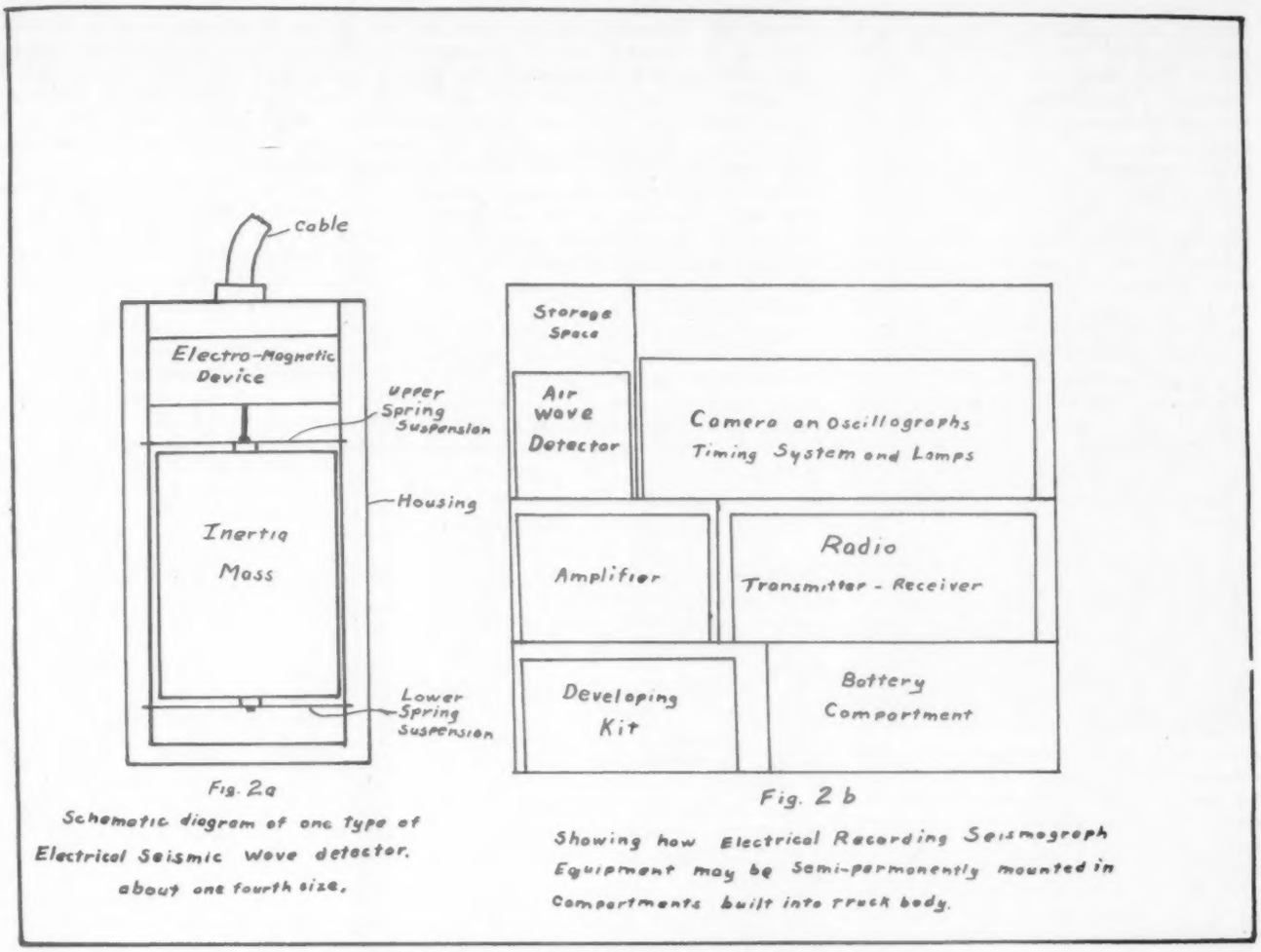

Cable
Electro-Magnetic Device
Upper Spring Suspension
Housing
Inertia Mass
Lower Spring Suspension
Fig. 2a
Schematic diagram of one type of Electrical Seismic Wave detector, about one fourth size.
Storage Space
Air Wave Detector
Camera on Oscillographs Timing System and Lamps
Amplifier
Radio Transmitter - Receiver
Developing Kit
Battery Compartment
Fig. 2 b
Showing how Electrical Recording Seismograph Equipment may be Semi-permanently mounted in Compartments built into truck body.

FIGURE 2—ELECTRICAL SEISMOGRAPH

2a. Sketch of one form of detector. This detector is the seismograph proper and converts the relative motion of the case and inertia mass into electrical energy by means of an electro-magnetic device incorporated inside the detector. It is connected to the amplifier by means of the cable shown. 2b. A typical arrangement of the various equipment inside the truck. These various instruments are semi-permanently mounted and only the detector and radio antennae system need be outside. The various controls are so arranged as to be readily accessible to the observer.

on the film by mechanical means, it is transformed into an electrical impulse. This electrical impulse is then fed into an amplifier of suitable design and from the amplifier into a galvanometer or oscillograph. The mirror on the oscillograph records on the film in a manner analogous to that used in the mechanical type of instrument. Figure 2 is a schematic drawing of an electrical recording seismograph with its usual accessories.

There are numerous types of seismic waves, all of which are of importance in earthquake seismology. On applying the seismograph to the survey of geologic strata, it was found that only the longitudinal type of seismic wave need be considered. When we speak of seismic wave we therefore refer to this particular type of seismic wave.

The velocity of propagation of seismic waves in any medium is a function of the physical constants of that medium. The frequency or wave length of these waves is also dependent on the physical characteristics of the medium transmitting the waves.

Various key strata in those territories where the application of the seismograph is most feasible, have radically different velocities and considerable variations in frequency of waves transmitted. In general the deeper strata have the higher velocity and the lower frequency. As a consequence those waves which penetrate to the deeper layers and, obeying the laws of refraction and diffraction, return to the surface, gain enough time in their transit through these higher velocity layers to arrive at the recording stations, placed within certain limiting distances from the shot point or source of the seismic waves, in advance of those waves transmitted entirely through the lower velocity, shallower layers. This is true in spite of the greater distance these deep waves are required to travel. If it is desired to explore these deeper strata it is not only necessary to choose the correct distances in order to record them as first events, but also to have equipment which is sufficiently sensitive to the lower frequencies of the waves transmitted through these deeper strata. This is particularly important because the energy transmitted by the deeper layers is usually much less than the energy transmitted by the strata nearer the surface. Considering the more complex path these waves must follow and the loss of energy at each refraction, such a condition is to be expected.

The first consideration in the design of seismograph equipment for geophysical exploration work is the choice of the general type of instrument. Both the mechanical and the electrical types of instruments have been used successfully in this work. Let us consider the practical differences in the operation of these instruments in actual field work. In the mechanical instrument, since the mirror is actually connected to the seismograph proper, and since the seismograph must of necessity be placed in firm contact with the ground, it follows that the camera and auxiliary equipment must also be placed on the ground. It is usual practice to separate these instruments by a distance of one meter in order to obtain the desired optical magnification. Since the film must be exposed to the light reflected by the mirror, and since daylight would so fog the record as to make it valueless it becomes necessary to either use a light tunnel connecting the camera and seismograph or else house the entire equipment in a light-proof tent. The latter is the more accepted practice. This tent is also useful for development of the record after the shot is taken. However the time required to

remove all equipment from the truck and to put up the tent, and after the record has been taken pack up the equipment, is considerable. With the electrical seismograph, all the equipment except the "detector" or seismograph proper is mounted semi-permanently in the truck. This considerably lessens the work and consequently the time required to make a station. Another distinct advantage of the electrical instrument is the ability of designing the detector so that it may be planted under water. This is particularly advantageous where it is desirable to do exploration work in lakes or swamps such as exist in South Louisiana. In the mechanical instrument, the magnification or amplification is fixed by the design of the instruments. It is impossible to vary it during adjustment for any particular record. As a result it is necessary to so fix the amplification of this type of instrument so that it will not be too sensitive under slightly unfavorable conditions. Otherwise, extraneous noises will often destroy records. This will require in the end a greater amount of dynamite than would be necessary if it were possible to adjust the instrument to a sensitivity comparable with the amplitude of the extraneous disturbances at any particular station. The variable and continuously adjustable sensitivity of the electrical instruments is a distinct advantage. The mechanical instrument measures the true motion of the earth caused by the seismic wave. The electrical instrument measures the velocity of the motion of the earth, and not in a direct ratio. There are very strong theoretical arguments regarding this point in favor of the mechanical instrument. While these may be of value from a research standpoint, experience in the field with both types of instruments do not show them to have any real significance in practical work. The mechanical instrument is necessarily built as a unit instrument, although it is comomn practice to include a horizontal and a vertical component seismograph in the same case. The electrical instrument may be constructed either as a unit or as a multiple instrument. The unit instrument has a distinct advantages in rapid reconnaissance work, due to its mobility and defiance of natural obstacles. However, the multiple instrument, in which two or more detectors are connected by wires to one camera and auxiliary equipment, offers certain advantages for profile work and particularly for reflection work. In this type of work, the computations are based on the interval in time of arrival of the seismic waves, recorded at two adjacent stations, on a line radiating from the shot point. The greater convenience and accuracy of several records on one film with one time system over the same number of records on different films with different time systems is obvious.

After the type of instrument to be constructed is decided upon, more detailed factors in the design must be considered. However, before such details may be worked out, it is necessary to know what frequencies the instrument will be required to record. Many companies have this data but keep it secret for obvious reasons. Data published on frequencies of waves recorded in earthquake seismology are of little value because of the vast differences in the distances and paths traveled by these earthquake waves. Most of the oil companies operating seismographs obtained this data by first constructing instruments designed for an assumed frequency, and used these instruments in research work to obtain more accurate data. The necessary modifications were then made before the instruments were put in actual service.

Factors to Consider

Factors that must be given consideration in the design of suitable seismograph equipment for locating and profiling petroleum producing structures may be conveniently listed as follows:

I. Weight, including carrying cases, if used.

II. Overall dimensions of complete equipment.

III. Provisions for prevention of damage in transportation of equipment by automobile over rough roads.

IV. Automotive equipment to be used for transporting equipment.

V. Sensitiviy, or amplification of seismograph.

VI. Frequency characteristics, or ability to record desired events of a particular frequency as well as, or better than frequencies caused by extraneous disturbances.

VII. Damping of recording instruments.

VIII. Timing system, which calibrates the film in time units.

IX. Simplicity of adjustments and operation.

X. Sensitivity of seismograph or auxiliary equipment to the sound or air wave used to determine the distance of the recorder from the shot point.

XI. Accessability for adjustment, repair or replacement of any parts that might prove defective or cause trouble in the field.

XII. Provisions for development of records in the field.

XIII. Method of transmitting the exact instant the shot is fired to the record.

XIV. Range, stability, simplicity and reliability of the radio equipment used for communication and recording of shot time.

XV. Power supply for electrical equipment. Includes radio, amplifier, lamps, timer system, film drive motor, etc.

XVI. Time required to set up full equipment preparatory to taking record.

Each of these various features will now be discussed at length.

I and II. The question of overall size and weight is obviously important. Under ordinary working conditions, the equipment is transported in automobiles designed for that particular use. However, occasions frequently arise when it is necessary to use more primitive modes of transportation if a particular station must be made. Every extra ounce of weight and every inch in dimension are magnified a hundredfold after a man has carried the equipment for some distance. Excessive weight under such conditions slow up the work and consequently make it that much more expensive.

III and IV. The average daily mileage of a seismograph party working at top speed is close to 100 miles per car. The roads traversed vary from paved streets to trails across prairies or through wooded areas. Some roads are rough, others are rougher, and so on. Obviously if unnecessary delays due to damage to equipment in transportation under such unavoidable conditions are to be prevented, it is necessary to use considerable forethought in designing the equipment used.

Some means should be provided for locking the mass in the seismograph proper, to prevent the straining or even breaking of the spring support of the mass or the attachments to the mass for recording the effect of the seismic wave. In the mechanical instruments, a locking screw is usually provided for this purpose. In the electrical instruments, the detectors are usually, due to their construction, less liable to damage from this cause. Since it is preferable to have them water tight, it is impractical to have any type of screw adjustment on the outside. These instruments are transported in an inverted position. A stop is provided in the upper part of the instrument to support the mass when the instrument is inverted. Since this inversion removes the load from the spring mechanism, it is almost impossible to damage the instrument by shock when carried in this position. It is essential that these instruments be held in an inverted position while being carried from the car to the hole in which they are to be planted.

A feature of particular importance in the detector design is the shape of the housing. It should preferably be of a small diameter (about three inches) and should have no projections on the sides. Best results are obtained by planting the instrument at a depth of several feet, and the smaller diameter simplifies the problem of digging a hole for the planting of the instrument. Since it should be tamped in firmly, difficulty will be experienced in removing it from the hole unless it is free of any projections on its sides. It is pertinent to mention the advisability of providing means for attachment of a cable for pulling the detector out of the hole. This eliminates the possibility of troubles arising in the leads due to their being put under unnecessary and excessive strain.

The type of automobiles to be used is a problem in itself. The territory in which the party is to operate must be considered. In general, a light car, with considerable road clearance is to be preferred. It should have reasonable power, and be equipped with stabilizers or shock absorbers. It should be of a popular make in order that repair parts may be obtained in various small towns in areas being explored.

It is rather difficult to state the type of body that will prove most satisfactory. A number of factors must be considered. Many companies use a panel body. The

(Continued on page 84)

Recording Instruments Aid *In Holding Wells to* Maximum Production

By WALLACE DAVIS
Staff Representative

FOR the well's sake, keep records on what it's doing! As argument is offered one of many cases where records are being found profitable to the producer. The case is not rare where recording equipment has paid for itself and declared a 1000 per cent. dividend for the user in a single day.

Humble Oil & Refining Company, owner of the entire production in the Sugarland, Texas, field, which is in its flush stage but which is being developed in an orderly, conservative manner, is keeping complete records on individual wells. Through such a program the company not only has available immediate knowledge of what each well is doing, but is daily collecting information for its permanent files. For instance, if the company completes a new producer during 1930 in this field, the knowledge of what the offset well's flowing pressure, crude temperature and gas-oil ratio were under given conditions on January 1, 1929, will serve as valuable information. Furthermore, if the petroleum engineer on the job finds that the temperature of a certain well is running high enough to forecast danger of encroaching salt water, he has the chance to attempt correcting the situation in advance by placing more back pressure on the bottom of the hole, or whatever job he has found suitable for the problem on this individual well.

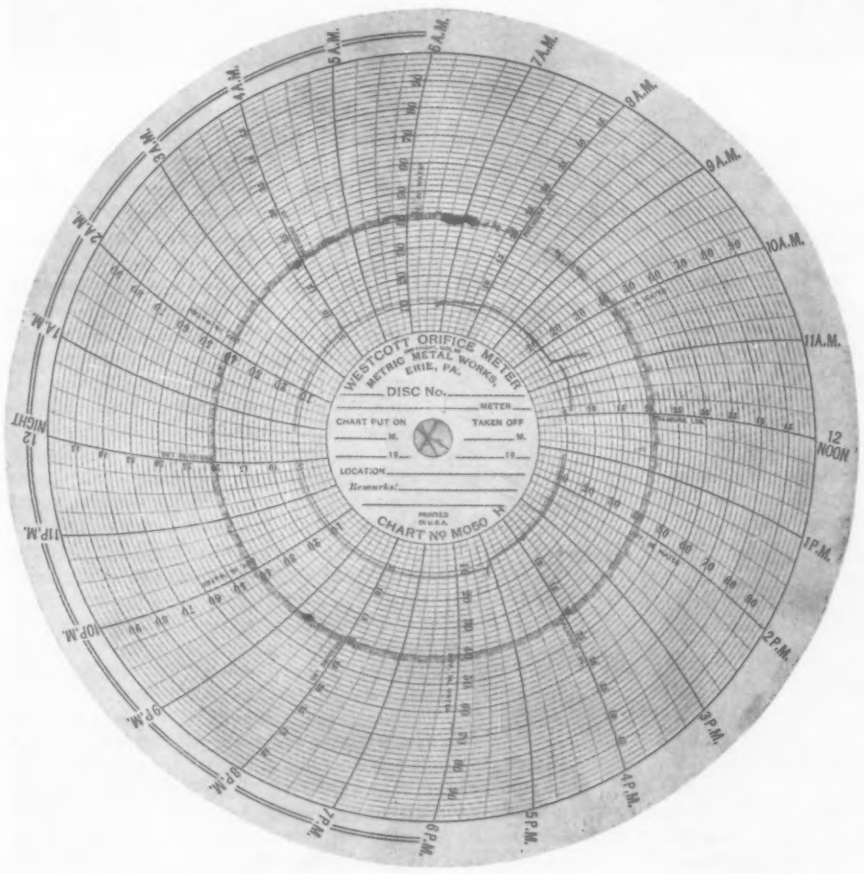
Humble Oil & Refining Company is taking a record of total gas produced by individual wells daily, taking an individual well gauge daily, and thereby arriving at the gas-oil ratio by days. By this system it has been possible to lower the gas-oil ratio on wells in the field, and thus conserve gas.

The elevated separator is also standard practice in the company. Less energy is required in raising the oil at the well, and, after oil and gas have been separated, the crude flows by gravity to the individual gauge tank. The amount of elevation necessary is determined by the elevation of the flow tank taking the oil. If a rolling topography permitted construction of the flow tank at a lower point than the well, then the separator derrick would not be necessary.

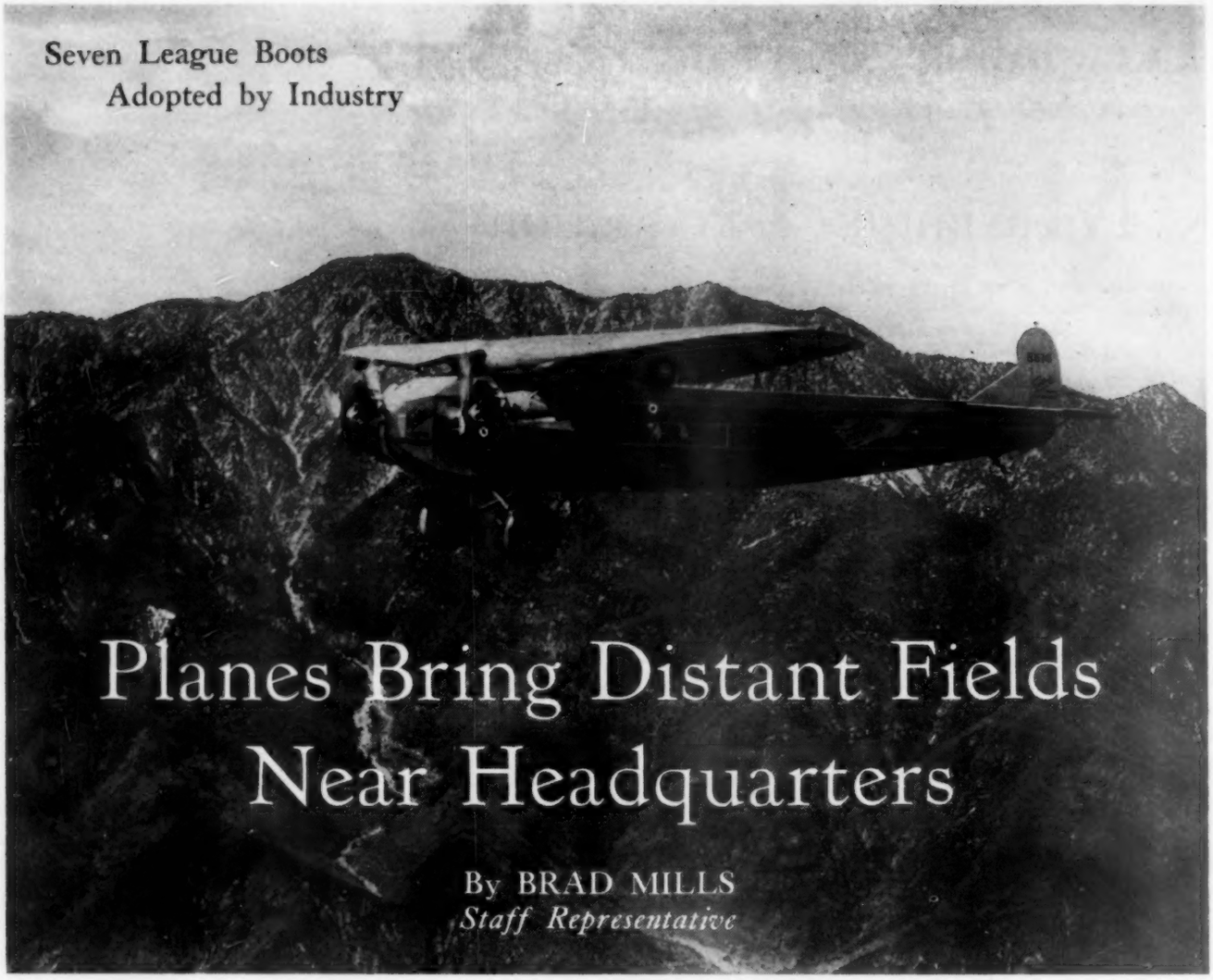
Smith Separator elevated to gravitate oil to flow tank, on Humble Oil & Refining Company's Dew 1 at Sugarland.

Production flows direct into the separator, oil and gas separated, and the oil gravitates into an individual flow tank to be gauged daily. All gas in the field is being used as fuel for drilling wells and incidental utilization. After the gas leaves the separator, it is metered in 24-hour periods through a Foxboro gauge installed on a by-pass along the line not far from the separator. Thus daily records of the gas-oil ratio on individual wells are kept.

A Tycos recording pressure gauge is set in the bull plug at the top of the casing head, and the well pressure is available at all times from records secured through use of a Wescott Orifice meter. The meter chart recording the constant well pressure also tabulates the constant temperature of the oil, this record being transferred to the chart from a thermometer hose leading off the temperature element which is installed in a bull plug set on the flow line "T" of the Christmas-Tree. The chart records temperatures from 60 to 260 degrees. While charts are used to register any amount of pressure, the accompanying chart is set to register pressure from zero to 1000 pounds. The inside record shows temperature and the outside record shows pressure. The temperature line shown here reveals that three times during the day temperature started rising, but is seen to have returned to its regular path by manipulation of the flow by the engineer.



Seven League Boots
Adopted by Industry



Planes Bring Distant Fields Near Headquarters

By BRAD MILLS
Staff Representative

KEEPING abreast with the march of progress and fully awakened to the realization that time is often more valuable than money, many major oil companies of California have become aviation enthusiasts within the short period of one year. It has also dawned upon them that a boost for aviation is automatically a boost for the petroleum industry, so why not get into the game for all it is worth? The handwriting has been on the wall for some time, one official stated, and the race for supremacy on land will soon be transferred to the clouds.

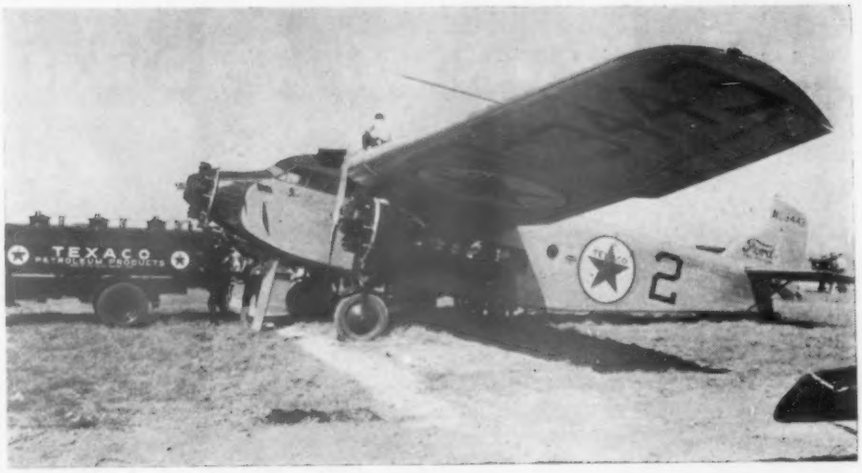
While the marketing end of the industry has received a liberal share of attention, the producing end has held its own and the many planes purchased by nearly all large companies have been used extensively by officials interested in the actual production of oil. The discovery of a new field, a conference in another city, disasters of one kind or another, and even a delicate cementing job have been responsible for production officials to press company-owned planes into almost instant service. They have found that Taft, for instance, which is six hours away at best by automobile, may be reached in less than an hour and one-half by fast planes. A new pipe line project was recently surveyed in less than a day by officials in the air—a job which would have required at least four days by automobile and on foot. With Los Angeles as headquarters, the plane sailed all the way to San Francisco and back, covering much territory which could not have been reached at all with a car. The route was even changed some in places as the result of the view from the air. The aerial survey, although nothing more than a tour of inspection, revealed the possibilities of the plane in general scout work.

Officials have found the airplane an ideal way to show visitors, prospective purchasers and visiting officials the oil fields of the state. Almost every day the giant planes soar out over the producing field of the Los Angeles basin, where clusters of derricks present a lacy effect every few miles. Local officials have said that they had never really seen the Los Angeles basin fields until they viewed them from an airplane. They had visited the fields for years, but their conception was completely changed when the entire area spread out before them.

The expansion of California companies to the Panhandle and western fields of Texas has influenced their action in the purchase of planes which will cover the distance from Los Angeles to El Paso, the gateway to the district, in one daylight trip. Producing leases are visited and the return made in a similar time.

California geologists who have taken the air for the first time state that they are enthusiastic concerning the future of aerial geology, and like the producer who had never seen his leases from the air, got a new conception of the districts. On one recent trip, a geologist discovered a fault which he had never been able to find on foot. It is believed that within a short time the larger California companies will provide their geologists with planes for aerial surveys. Already several aerial reports have been made.

The Standard Oil Company of California was one of the first producing companies to purchase a giant plane for official and public service. The monoplane, one of the largest ever brought to California, is of all-metal construction and was specially built for the company by the Ford Motor Company. It is of immense proportions, the span of its great wing being 74 feet and the wing area being almost 800 square feet. The body has an overall length of 50 feet. The plane is powered with three, nine-cylinder, radial type, Wright Whirlwind type motors of 220-



The Texas Company's Tri-Motored Plane

horsepower each. The top speed is about 125 miles per, with a cruising speed of almost 100 miles per hour. The gasoline capacity is 300 gallons, which is sufficient for a sustained flight of nearly nine hours, provided head winds are not encountered. The great size of the plane indicates that the weight is excessive; but despite its all-metal construction, it weighs only slightly more than 6000 pounds and can carry a dead weight of about 4000 pounds. The cabin is built to accommodate 14 persons with comfort. Heaters, a writing desk, a radio set, card tables and a washroom are included. The interior of the plane is all that could be expected of the finest family sedan. The cabin contains six large upholstered chairs and the walls are covered with a silk brocaded fabric. Indestructible plate-glass observation windows give a full, sweeping view on either side. The plane has been christened "Standard of California No. 1."

The huge motors are equipped with starters. The plane is equipped with dual controls, both being located in the glass-enclosed cockpits, where the pilot and mechanic sit, side by side. The pilot's view is even better than that afforded from the cabin. The usual tail skid is replaced with a small pneumatic-tired wheel. Both this and the main landing wheels are equipped with individual hydraulic brakes, which make it possible to pivot or turn the plane sharply around.

The Standard Oil Company last December purchased a smaller plane, a Boeing bi-plane powered with a 525-horsepower radial engine. This small plane has been christened "Standard of California, No. 2." The plane will accommodate four persons, two in the cabin and two in the cockpit. It is ideally suited for shorter field trips.

The Standard Oil Company feels that its first plane, the giant "Standard of California No. 1," has already paid for itself in actual service. From a producing standpoint, it has not been used extensively, but a trip or two to Texas fields has shown its possibilities and the time probably will come when planes will be used almost exclusively for long trips.

Richfield Oil Company, one of the newer California producers but one of the most progressive, recently purchased a giant tri-motored Fokker plane for official and public use. This is a specially designed plane and was built at a cost of about $90,000. It is one of the finest ever brought to California. The plane has been placed at the disposal of the governors of three Pacific Coast states for the entertainment of distinguished guests. It is also extensively used in flying over producing fields. The plane has a 14-place cabin arrangement and has one of the finest interiors ever built into a monoplane. The arrangement is such that conferences or card parties may be held at leisure.

Two smaller planes have been used for some time by Richfield Oil Company. They are small monoplanes and are used extensively in the marketing department.

The Texas Company of California, one of the most enthusiastic advocates of aviation, recently purchased a Ford-Stout monoplane for company use. The plane has a 74-foot wingspread and is equipped with two Wright Whirlwind motors, one each wing, and a 400-horsepower Pratt and Whitney "Wasp" motor mounted in front. It is a luxuriously equipped cabin plane, with accommodations for 10 persons, plus a liberal amount of luggage. Regular and reserve tanks give the plane a cruising radius of 1500 miles. It has a top speed of 125 miles per hour and a cruising speed of 100 miles per hour. It has all modern conveniences for travelers' comfort.

Union Oil Company has been one of the pioneers in aviation, but has been content to use smaller bi-planes. The first plane of the present fleet, a Travelair OX-5, was purchased less than a year ago. The second Travelair, similar to the first, but equipped with a Wright Whirlwind motor, was purchased during the summer. Two Eaglerocks, equipped with Hallett, radial air-cooled motors, were purchased in November. Although chiefly used by the marketing department, these planes are available to the producing department in case of special need.

Associated Oil Company fell rapidly in line by purchasing a specially built Boeing mail plane. It is one of the fastest model monoplanes and is equipped with a 425-horsepower Pratt and Whitney "Wasp" motor. Although a small plane, it is fitted with almost every known safety device. In addition, it contains a small cupboard for carrying food during long flights.

Fields formerly regarded as "in in northern part of the state" are now referred to as "nearby fields." Airplanes have changed this mode of reasoning.

Los Angeles producers holding conferences in San Francisco at 2 p. m. now leave the former city at 10 a. m., where they formerly left the night before.

Standard Oil Company of California's Giant Tri-Motored Plane

The Latest *from* Baku

By KING HAMILTON GRAYSON
Consulting Research Engineer

PETROLEUM resources of the Soviet Union are not only the greatest in the world, but each of the geological surveys being undertaken by the government is adding fresh reserves to the already great totals. All the reserves have not been determined, even in the exploited fields of Baku and Grozny. For Baku alone, latest estimates vary from 300,000,000 to 900,000,000 metric tons in reserve.

Baku and Grozny fields have been the most productive thus far. Those of the Emba-Ural district have been advancing steadily. Petroleum has been found in the Maikop district, in the Province of Kuban, at the western end of the Caucasus, at Tcheleken Island in the Caspian sea, in the Ferghana district of Turkestan and on Sakhalin island in the Pacific, as well as in several parts of Siberia.

As regards production, the oil industry is mainly conducted by three trusts, operating respectively at Baku, Grozny and Emba. The Oil Syndicate, in which the three trusts have representation, handles the marketing of their output. Before the war the Russian oil industry was hampered by uneconomic methods and constant clashes of small economic units. Labor conditions were very bad and early in the century a series of strikes crippled production.

Nationalization of the industry under the Soviet program brought cohesion and a rational plan of development, incidentally making possible large economies of operation. Since the day when nationalization started, the industry has been developed conservatively. As a result, substantial technical improvements have been effected.

During the fiscal year of 1924-25, machinery worth $3,000,000 was imported from the United States and $36,500,000 was spent for restoration and expansion in the fields. In the following year the Soviets spent $58,600,000 for further progress, with the result that the average monthly production reached 941,350 metric tons throughout 1928. During this year $111,168,000 was spent for capital investment in machinery and equipment, and in 1929 the budget calls for an expenditure of $115,617,000. Ten cracking units will be included for installation during the coming year. Greater development is already planned up to 1933. By 1930 it is reasonably anticipated that production will reach 17,000,000 metric tons, or 185 per cent. of the production for 1913.

Distribution of Reserves

Surveys and development work during the past four years have brought the total reserves of petroleum up to 2,883,800,000 metric tons, which are distributed as follows:

Region	Metric tons
Baku	1,442,600,000
Grozny	900,000,000
Kuban	65,600,000
Transcaucasia	32,800,000
Urals	262,400,000
Ukhta	32,800,000
Sakhalin	98,400,000
Cheleken	32,800,000
Ferghana	16,400,000

Total production of petroleum in Russia in 1913 was 9,194,000 metric tons. This was increased by 1927 to 10,129,500 metric tons, and in 1928 (year ending October 1), the total output was 11,296,200 metric tons. A large portion of the production is marketed through American companies, under contracts with the Oil Syndicate and the Soviet Naptha Syndicate. This latter organization has contracted to ship to the Standard Oil Company of New York and the Vacuum Oil Company products valued at an average of $10,000,000 annually. The output for 1928 was 1.9 per cent. over the schedule pre-fixed by the Planning commission, due to the increase in the Grozny fields.

Drilling of 346,000 meters was the record for 1928; and the three refining trusts converted 8,760,000 metric tons of crude into finished products.

As part of the 1928-29 program a number of new large refineries will be built at Batum and Tuapse. The Batum refinery will add 50 per cent. to the capacity of all plants, and the Tuapse refinery will increase the present total of refined products from the Gorzny district by one-third. Fifty-four per cent. of the drilling in Baku district has been done with American rotary drills, and seventenths of the entire non-gusher production is coming from electrified wells. Russia exported 914,032 metric tons of oil during 1913. This increased to 1,316,000 metric tons in 1924-25, and to 2,085,916 tons in 1927, with still greater exports during 1928 and planned for 1929 and 1930. An average of 37,000 to 38,000 workers are employed in the petroleum industry, and from 300 to 500 wells are being drilled monthly.

Expansion Planned

One of the new power plants under construction will be operated with oil as fuel. This is the station at Novorossiisk, which will have a capacity of 22,000 kilowatts. Other oil burning plants are included in the plans for construction during the next five years. Development of oil wells and refining is designed to keep pace with that of power production. The refining industry is also closely allied with the program for building the world's greatest commercial air fleet, with the use of oil-burning locomotives on transportation lines and of Diesel engines on river boats.

Azneft and Grozneft are the two principal producing trusts in Soviet Russia, the former having an output in 1928 of 7,555,000 metric tons of crude petroleum and 160,000 tons of gas, and the latter an output of 3,442,000 metric tons of oil and 16,000 tons of gas.

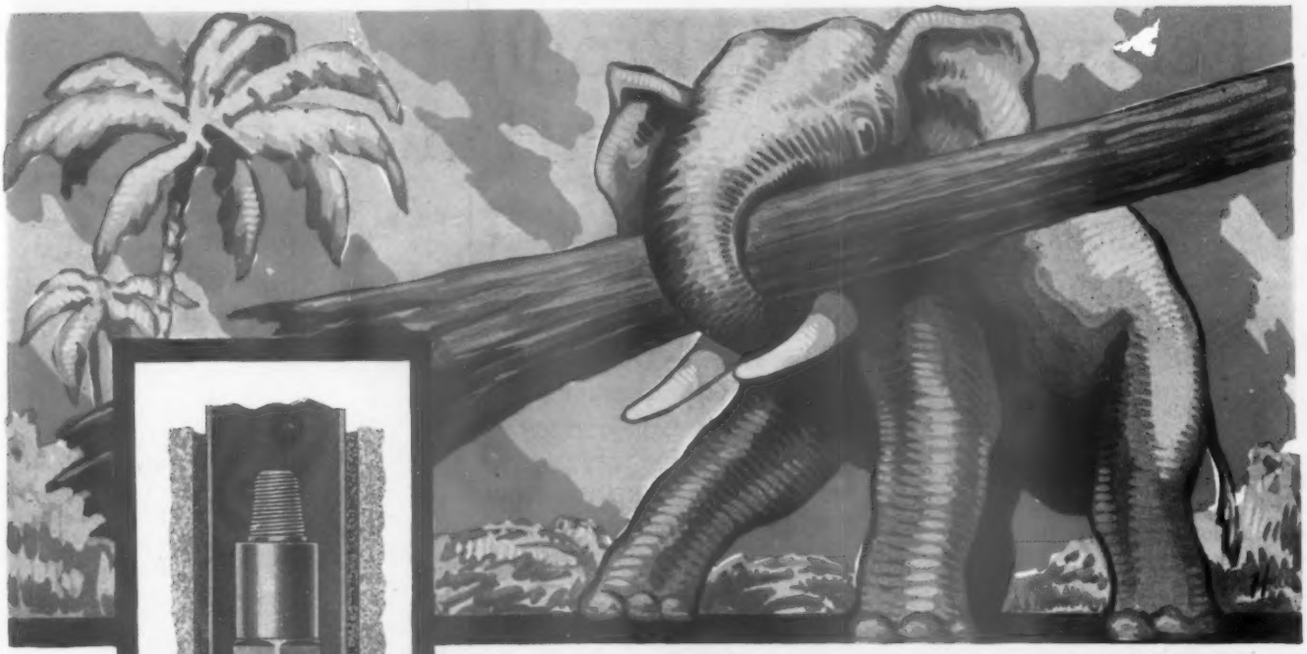
Four steamer loads of machinery and tank cars with equipment for a narrow gauge railroad were recently dispatched by the government to Sakhalin, where intensified development of oil fields is in process. This field is operated by an independent trust known as the Sakhalineft, an off-shoot from the Embaneft. The railroad is ready for operation and connects the oil fields near Okha and the seaport. Six hundred workmen are employed in this area, consisting mostly of Japanese and Manchurians. The output is disposed of through Kito Karafuto, owners of the Japanese concessions in Sakhalin Island.

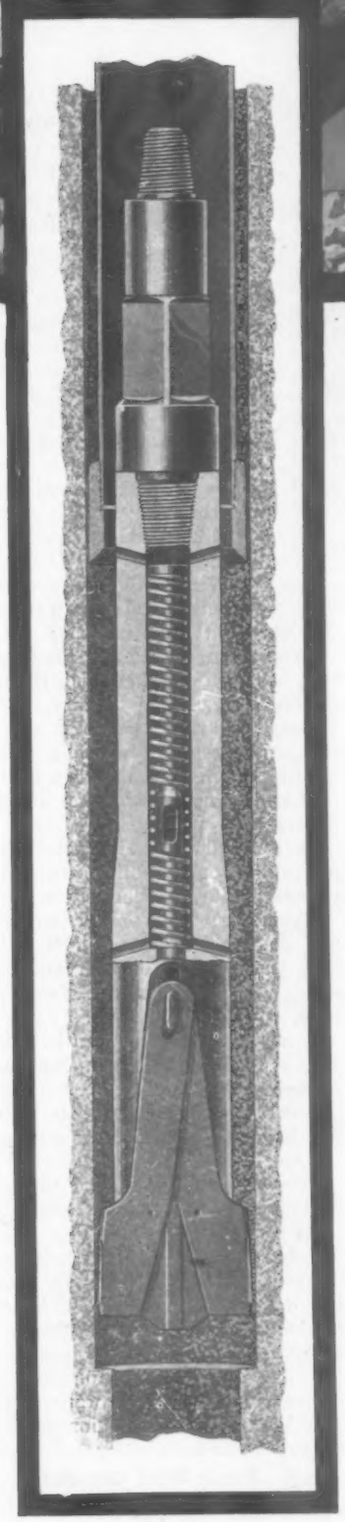
One of the recent Soviet undertakings is construction of a pipe line from Moscow to the Caspian Sea for transportation of crude from Caspian wells to refineries in Moscow province. Forty million dollars is being spent on this project, which is one of the largest undertakings of this character on record.

Inducements to Foreigners

Under the recent decree of the Concessions Commissariat, foreign capital may enter the fields in Central Asia, South Urals and Caspian Sea. Such concessionaires will be permitted to market their product freely, with provision that all necessary machinery which they cannot secure in the Soviet Union will be allowed to enter from foreign countries free of duty. As an inducement to foreign aid in developing newer oil districts of the Soviet Union, reduced rates will be granted in special cases by the railroads. American technicians are in demand and the latest decree provides a general invitation to American engineers to come to Russia, offering them $500 per month plus expenses on very satisfactory living terms.

Automobiles are very limited in the union, but once they become a regular commodity, instead of a luxury, and motor transportation becomes developed to the extent planned, the petroleum industry will be in perfect tune to take care of the demand for gasoline and lubricants. This condition is not distant as things now stand, and 1929 is destined to see some remarkable advances in road construction, carrying with it a large increase in automobile use, a big increase in motor bus operation in the larger cities and into interurban sections where roads will permit and a greatly expanded program in the construction of commercial planes and of countless other oil-consuming devices. The oil industry expansion is a part of the great industrial expansion which is under way from the European borders to the Pacific shores of Siberia.





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February Crude Production Tops January Despite Handicap

Efforts at curtailment in flush areas, fewer days and smaller completions all fail to stop upward trend in United States

By Wm. V. GROSS
Staff Representative

NOTWITHSTANDING concrete attempts at curtailment throughout the nation in view of the industry's generally over-produced condition, daily average production for February registered an increase of 50,577 barrels over that of January. Daily production in February averaged 2,684,827 barrels.

Flush areas in Texas and California were largely responsible for the continued upward trend of production. Gains were general throughout Texas, whereas California's increase was due principally to exploitation of Santa Fe Springs. Daily production during February in Oklahoma, Kansas, Arkansas, the Eastern States and the Rocky Mountain States was well below the figure established by them in January.

UNITED STATES PRODUCTION

Following is the gross production of crude oil in the United States during February, as compared with January:

	Production Total February	Daily Average February	Daily Average January
Oklahoma	20,013,900	714,782	722,550
Kansas	2,682,150	95,971	97,150
Texas Outside Gulf Coast	18,013,900	643,353	628,750
Gulf Coast	3,984,750	142,312	138,350
North Louisiana	999,250	35,687	36,350
Arkansas	2,089,000	74,607	78,600
Eastern States	3,039,150	108,537	111,900
Rocky Mountain	2,009,600	71,771	73,250
California	22,338,600	797,807	747,350
Totals	75,170,200	2,684,827	2,634,250

A rather sharp drop was registered in the number of completed oil wells and their total initial, regardless of the fact that February's drilling days are three less than January's. Out of a total of 1434 completions, the initial from February's 830 producers was only 236,071 barrels, or an average per well of 284 barrels. January witnessed the completion of 1221 successful oil wells with an aggregate initial of 746,564 barrels, or more than three times as much as the initial of February.

Explanation of this situation is partially made by lifting the ban on certain areas where a number of producers had been choked down. West Texas, for example, previously had been producing only a fraction of its potential daily yield from completed wells. Many of these wells were opened up. The same holds true for many wells in the Los Angeles Basin of Southern California, particularly those producing from the newer sands at Santa Fe Springs, where efforts at curtailment have been of no avail insofar as the field's total is concerned.

Gas wells completed during February totaled 150, with an estimated initial daily yield of 2,114,750,000 cubic feet.

Successful wildcat completions in North and Central West Texas districts have been comparatively few this year, and considerably below the quota contributed during the same period last year. In the face of a general movement to restrict wildcat activity, pending the arrival of a more favorable crude market situation, many new tests were started during February, especially in the West Texas district. Independent wildcatters are meeting with better success in selling offset lease protection around their tests in the West Texas district to major companies and independent concerns than those trying to promote a well in the older producing sections of North and Central West Texas, where flush production is lacking. Although this condition should be reversed, the concerns contributing to wildcat developments hesitate on taking a chance on being left out of a potential flush area, regardless of overproduction and low crude prices.

Field work lagged behind in all areas in West Texas, with the sharpest decline taking place in the Hendrick field, Winkler County. Contrary to expectations, this slack in activity has not been offset by new work in the O'Brien, Daugherty and Llano pools, Winkler County. The only work of any consequence in Hendrick field is not concentrated on the south end of the structure, which has not been defined. Drilling in the Yates field declined to less than a half-dozen active tests during February, owing to existing proration rules killing the incentive to drill up proven locations.

Wilbarger County, which is the largest source of new production in the North Texas district, suffered from lack of water for drilling purposes during the latter part of February, and the scarcity of water was also felt in parts of Archer and Young Counties. The largest producer completed in the district came from the southwest side of the Bulcher, or Hoosier field, Cooke County, late in February, when The Texas Company's Dennis 5 swabbed and flowed 950 barrels from 1195-1229 feet. The K-M-A & Iowa Park fields are the only active sections in Wichita County, and attractive pumpers are being scored from the 1400-foot sand in the K-M-A field.

Activity in the Texas Panhandle district has been curtailed since the lowering of crude prices in January, with Gray County supplying more than one-half of the active tests. A growing market for natural gas in this district is now an important source of revenue for the producers.

Determined effort to curtail the crude oil production was the outstanding development during February in Oklahoma.

Oklahoma's daily production bobbed up and down. Due to much flush production, the result of conservation did not show a reduction in the state's monthly total.

A new conservation plan is causing the state's production to jump up and down is the Sunday shut-down plan. Sunday's production is generally about 80,000 barrels lower than that of the other days of the week.

From a field standpoint, the most important event was lifting drilling restrictions at Mission and drilling in approximately 60 wells to the Wilcox sand pay. Their recovery was generally disappointing, but the large number boosted the production to close to 50,000 barrels, which made up for the proration efforts in other fields of Seminole. Mission comes under the proration program March 1, and a reduction in Seminole production is certain.

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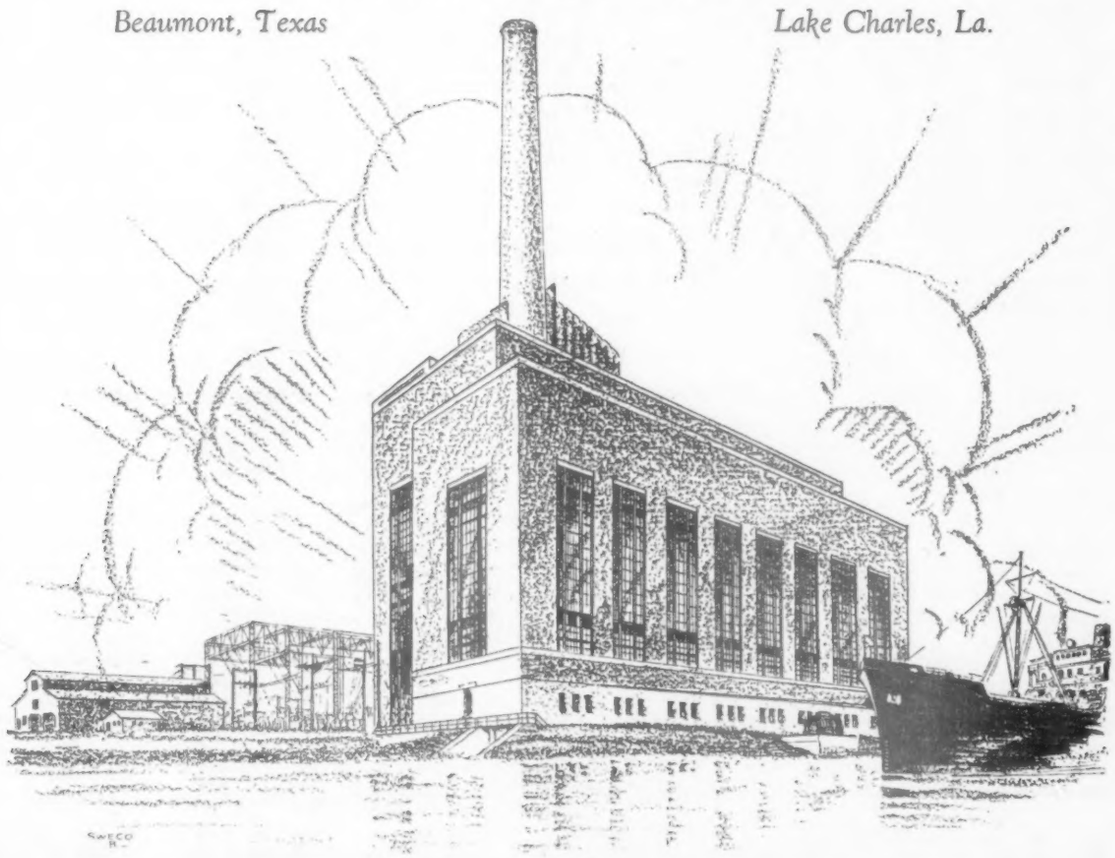

Under executive management of Stone & Webster, Inc.

pleted in Oklahoma, and the largest Misener sand well in history, was completed in February, but it turned out to be a freak performer. It was Gypsy Oil Company's Miller 3, SEc NE SE Section 18-8-5, Maud field. It did as high as 900 barrels per hour, with such great pressure as to break the control head, permitting it to flow on ground. Pressure soon went off and its production fell sharply, like history of other big Misener producers.

The Misener-Hunton producing area of Maud was more closely defined on all sides during the month by dry holes, and failure of new completions to show the life of earlier ones caused a drop in Maud production.

Intrusion of water and decline in pressure of the discovery well at Oklahoma City also caused this area's possible potential production estimates to be lowered. It will be early May before any other completions will be made. Meanwhile, the possibilities of the district will remain questionable.

Prospects of big production in the deeper pays of Southwestern Allen field were killed temporarily by failure of tests to find anything of importance.

Increase Predicted for Valley Center

Production of the Valley Center field of Sedgwick County failed to increase materially during February, although a few new wells were placed on production. During March the output of this new pool is expected to show considerable progress from new completions that should swell the total to above 10,000 barrels per day.

The producing area was extended slightly to the east by Hays & Reynolds in Section 7-26-1e. Their well produced about 500 barrels. Several wildcat showings of importance were also found, including a couple of small wells several miles from production in the eastern part of the county.

In Marion County, the second and third wells in the new deep sand of the Davis pool were completed. This field promises to be prolific.

Another producing well was added in Western Kansas, when Davis, Hazlett et al's Wieland 1, Section 1-13s-16w, Ellis County, did about 120 barrels in seven hours from the Oswald lime at 3004-14 feet. Several other showings were found in various wildcat tests which encouraged wildcat operations.

California Active

February saw production pass 800,000 barrels per day in California, with a monthly average slightly below this figure. The increase was caused by the rapid rise in light oil and inability to curb activities in critical areas. Heavy oil producton held steady during the month. The sharp increase in light oil was handled without a hitch, although much of the crude went into storage. Constracts covering the purchase of light oil in California are so far reaching that oil which was not covered by written agreements was negligible. This condition helped to prevent a large floating supply of crude, with a corresponding weakening of the oil market.

Santa Fe Springs apparently reached a peak late in February, just topping 200,000 barrels. The figure was considerably short of the predicted top, but the collapse of the Nordstrum zone and the failure of the Buckbee to extend to all parts of the field had a telling effect. About 50 wells were completed during the month, with an average initial production above 3000 barrels. The decline was extremely rapid.

Discovery of three new deep zones in rapid succession overshadowed the failure of the field to forge ahead after the 200,000-barrel level had been reached. These were the O'Connell, Upper Clark and Lower Clark zones and were found at 6300 feet, 7200 feet and 7800 feet, respectively. The O'Connell zone apparently is a thick body of sand and shale which may create a new peak for the field later in the year. Both the Upper Clark and Lower Clark zones were found near the ends of the structure, but they are important, because they should be much better near the apex of the field. It was later revealed that the O'Connell and Upper Clark zones might be one and the same in inside wells. At any rate, it seems likely that both zones will be produced with one string of casing.

The O'Connell zone was tested in the discovery well, but the flow of 1200 barrels of oil and 2000 barrels of water failed to meet expectations. Several other wells will soon be tested in the zone.

Attempts were made to test the Upper Clark zone but its thinness and the difficulty in landing a shutoff string of casing prevented so doing.

Detail Figures for February on Page 76

Conservation Attempt Fails

Advocates of conservation started plans to halt development of all zones below the Buckbee. They attempted to sign at least 80 per cent. of the operators, but had failed to do so at the end of the month. The extremely deep zones offer promise in areas which did not produce at all in the Buckbee, hence many leaseholders are anxious to test these formations.

Long Beach showed little change during the month, managing to average around 180,000 barrels. The decline has been very slow, due to the completion of several wells each week. A survey of the field showed 150 drilling wells, an unusually large number at this stage of development. The decline from the older wells has been slow, with many producing from almost 2000 feet of oil sand.

Kettleman Hills took its place among the most active areas of the State during the month, drilling wells reaching 25. Spurred on by the continued flow of the discovery well, the prominent operators have set aside large appropriations for further developments.

UNITED STATES FIELD STATISTICS

Following are the completions, showing oil wells, gas wells, failures and initial production of crude by states for the month of February, as compiled by the OIL WEEKLY.

State—	Completions	Producers	Gas wells	Failures	Initial Prod.	
Arkansas	24	13	3	8	1,540	¶ 105
California	95	92	.	3	175,625	..
Illinois	9	3	.	6	187	
Indiana	4	3	.	1	45	
Kansas	36	12	3	21	3,090	¶ 3¾
Kentucky	106	62	3	41	1,764	¶ 5½
Louisiana	45	12	10	23	3,107	¶ 125
Michigan	31	18	3	10	6,820	¶ 14½
New York	14	14	.	.	42	
Ohio	154	58	51	45	1,858	¶ 78¾
Oklahoma	241	136	30	73	97,827	¶ 376
Pennsylvania	122	97	17	8	1,073	¶ 40¼
Texas	553	310	30	213	203,093	¶1,366
W. Virginia	89	16	63	10	305	¶ 60½
Total	1,434	830	150	442	236,071	¶2,114¾

PAST TWELVE MONTHS

The record for the past twelve months is an interesting study for comparative purposes, the following table giving the field statistics for all States in the Union:

Month—	Completions	Pro-ducers	Gas Wells	Failures	Initial Prod.
February, 1928	1,376	729	197	450	336,319
March	1,693	884	283	526	555,613
April	1,486	772	216	498	397,825
May	1,495	770	186	539	413,378
June	1,545	896	136	513	457,662
July	1,534	882	189	463	522,969
August	1,730	974	217	539	969,742
September	1,809	1,050	223	536	976,494
October	1,729	979	237	513	566,766
November	2,082	1,178	306	598	438,228
December	1,742	981	250	511	429,869
January 1929	2,068	1,221	262	582	746,564
February,	1,434	830	150	442	236,071
Total, 1928	19,424	10,735	2,619	6,070	6,461,015
Total, 1927	21,801	13,045	2,554	6,202	4,487,583

Note—Rocky Mountain data omitted.

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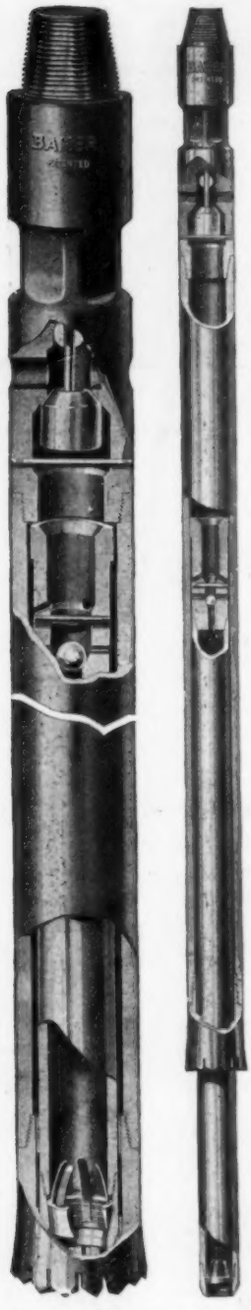

Baker Standard Core Barrel, showing relative positions of outer barrel at beginning and end of drilling stroke. Left: Position at beginning of drilling stroke. Right: Position of drill barrel shoe at the end of drilling stroke.

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TABLE OF CONTENTS

Special Features

Limitation of Crude Output Up to Regional Committees ... 19
By Wallace Davis

Battle-Front Shifts at Maracaibo ... 23
By Roy E. Leigh

Kettleman Hills High Pressure Area Proves Interesting Development ... 26
By Brad Mills

Factors in Design of Portable Field Seismographs ... 28
By Mark C. Malamphy

Recording Instruments Aid Maximum Production ... 31
By Wallace Davis

Planes Bring Distant Fields Near Headquarters ... 32
By Brad Mills

The Latest From Baku ... 34
By King Hamilton Grayson

February Crude Production Tops January ... 36
By Wm. V. Gross

Veteran Employes Take Official Places With Magnolia ... 52

Geologists' Program—Fort Worth Meeting ... 67

Abstracts of Papers on Geologists' Program ... 69

Summary of Field Operations for February, 1929 ... 76

Regular Departments

Advertisers Index ... 130

Markets-Production-Crude Prices ... 43

United States Production Estimates ... 45

Crude Oil Price Quotations ... 47

Completions for Past Week in All U. S. Fields ... 99

Permits Granted for New Wells ... 104

Wildcat Drilling Reports from All Important Areas ... 108

News from California Fields ... 55

North and West Texas Field Notes ... 61

Gulf Coast Field Development Notes ... 64

Oklahoma-Kansas Field Notes ... 59

Louisiana-Arkansas News Notes ... 121

Personal Mention—Men You Know ... 51

New Equipment, Catalogs, Bulletins, Books ... 125

Squeaks from the Bull Wheel ... 128

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CONTINENTAL

Say you saw it in The OIL WEEKLY

Markets--Production--Crude Prices

H. J. STRUTH, *Staff Economist, Houston, Texas*

Domestic Production Continues Downward Trend

UNITED States daily average production dropped 40,800 barrels during the week ending March 16, due to substantial declines in the critical states and Rocky Mountain fields. Oklahoma, Texas and California, a trio which has been responsible mainly for late accumulation of stocks, alleviated the situation considerably by showing an aggregate loss of 37,950 barrels from the previous week's daily yield, helping to bring the nation's daily production down to 2,625,150 barrels.

The welcome decline is due to lack of initial and to the fact that wells which were opened up late in February in such areas as Santa Fe Springs, California, and West Texas are approaching the class of settled production.

Nothing indicative of immediate interruption of the trend established last week is apparent.

Although strengthened by the Sunday shutdown program and daily proration of production in Greater Seminole district, the Oklahoma crude oil market is not in as strong a position as had been hoped.

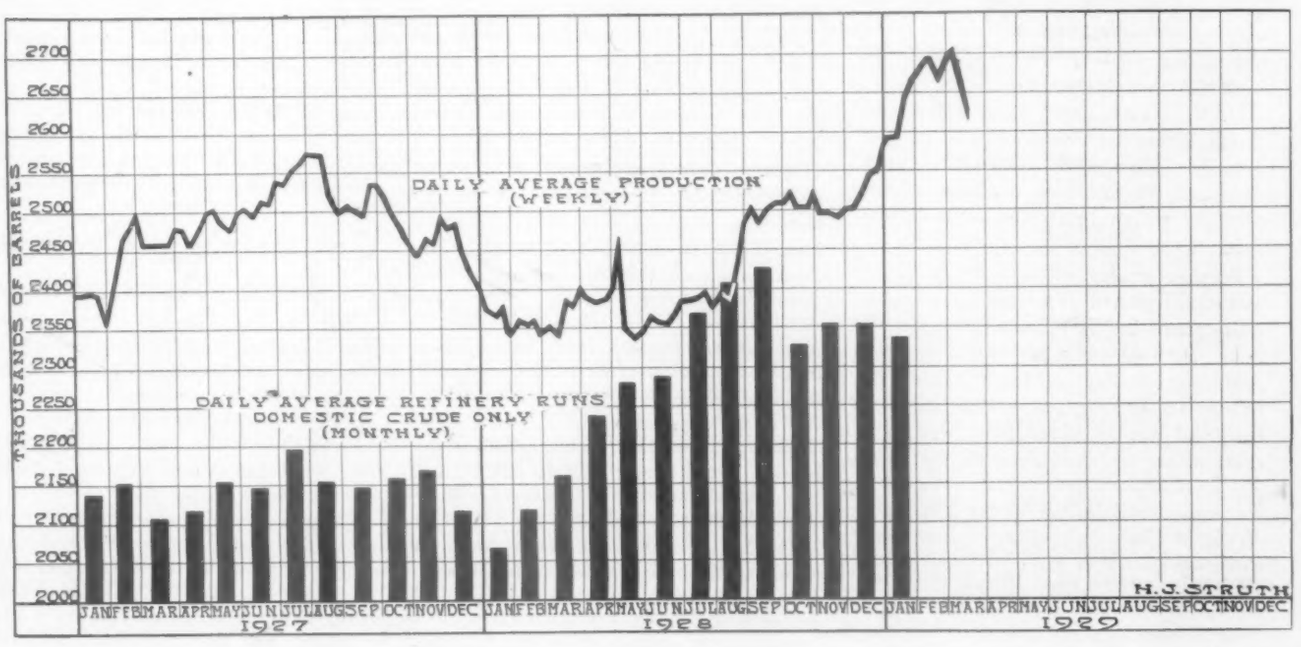
This is due to failure of operators to curtail production to the full extent of the proration percentages.

A material reduction in production of the last period, compared with the previous two-weeks proration era, leaves Umpire Ray Collins optimistic over prospects of getting the output down to the allowable 650,000 barrels during the period from March 15th to April 1st. Further participation of companies in the Sunday shutdown plan is expected to be beneficial.

There continues to be a heavy premium paid for Burbank field crude oil because of its lub quality. Recently two purchases were made known at a premium price. Carter Oil Company has bought from the Mid-Continent Petroleum Corporation a 55,000 barrel tank of oil which the Mid-Continent previously bought with a 10-cent premium, so it is probable that Carter paid a larger premium than this amount. Marland Production Company has contracted to take the Kewanee Oil & Gas Company's production from its lease in the NE¼ of Section 28-27-6, for a period of one year at a reported premium price of 20 cents above the posted schedule. The lease is doing 900 barrels daily.

Gasoline market strengthened during the past week in Group 3, as a result of fine weather and the approach of spring with farmers preparing to do their plowing. The general quotation in U.

DOMESTIC PRODUCTION AND REFINERY RUNS



DETAILS OF CRITICAL FIELDS

Pool	Wells Completed	Total Initial Production	Initial Per Well	Number Producing Wells	Daily Production Barrels	Daily Production Per Well	Rigs Up	Wells Drilling
WEST TEXAS—								
Hendrick	551	2,947,580	5,349	563	171,280	304[1]	6	27
Church & Fields	189	203,465	1,077	187	27,640	148	.	.
Gulf-McElroy	71	56,345	794	71	12,680	179	2	1
Yates	299	2,017,215	6,747	298	86,135	289[1]	4	7
Totals	1,110	5,224,605	4,707	1,119	297,735	266	12	35
TEXAS PANHANDLE—								
Hutchinson County	1,150	550,400	479	1,003	26,205	26	2	19
Gray County	335	139,315	416	317	21,550	68	10	41
Carson County	186	60,755	327	156	6,180	40	2	16
Wheeler County	44	14,645	333	35	660	19	3	18
Moore County	11	6,145	559	9	1,360	151	2	11
Totals	1,726	771,260	447	1,520	55,955	37	19	105
OKLAHOMA—								
Seminole	1,792	2,261,840	1,262	1,458	273,096[2]	187	28	237
St. Louis	387	385,292	995	320	93,853[2]	293	10	78
CALIFORNIA—								
Santa Fe Springs[3]	142	455,400	3,207	117	148,000	1,265	30	177

[1]Production partially pinched.
[2]Prorated.
[3]Deep production only. For field total add 220 wells and 20,000 bbls.

S. Motor is 7 cents with some quoting as high as 7¼ cents per gallon.

Oklahoma kerosene market continued to firm up and is now around 6 cents, or slightly better, per gallon. Use of kerosene in tractors for farm use is thought to be a material factor in causing jobbers to stock up.

Gasoline Strong

A firm price structure prevails in the North Texas gasoline market even though March sales on this commodity have not been very active. Plant owners are confident of a price advance with the arrival of more favorable motoring weather and are accumulating stocks rather than stimulating trading with shaded quotations.

U. S. Motor gasoline is netting the North Texas refiners an average of 6¾ cents per gallon, while a good market prevails for all kerosene available at one cent per gallon below the above quotation.

Popular grades of fuel oil in North Texas are quoted at 65 cents per barrel, while plants in West Texas are receiving from 40 to 45 cents per barrel for zero cold test products. Plants near Big Spring are turning out a high cold test fuel, and are penalized from five to 10 cents below the quotations of the Pyote district plants.

Crude stocks in the Texas Panhandle district at close of February were credited with amounting to 16,074,385 barrels, or 226,500 barrels increase during the short month. Stocks also gained in January, as 197,285 barrels were added during that month.

California

With production dropping rapidly from the February peak, the crude market in California has shown additional strength. This drop is not expected to carry through to the level of a year ago, however, unless acted upon by some external force. Halting drilling operations would bring about the desired results, but it is doubtful if such steps will be conssummated at this time. A bill to stop the wastage of natural gas will be presented to the state legislature immediately. The bill will be sweeping enough to force a proration of oil in the critical fields and is expected to curb future overproduction.

Santa Fe Springs staged the slump predicted a week ago, due to the small number of completions in the Buckbee zone and the inability to reach the deeper zones. The drop will continue until the O'Connell zone comes to the rescue. Efforts to halt development of this very deep sand have not been successful and it looks as if the field will be swept by another wave of drilling. The O'Connell zone is an unknown factor, however, and several wells will be required to show its possibilities. Decline from the Buckbee and Nordstrum zone wells may be enough to offset, in part, the gain from deeper development.

With a production of more than 30,000 barrels, the Elwood field is becoming a real market factor in California. The oil is very light and finds a ready market.

The heavy oil market has shown little improvement and is expected to show no change for the better as long as there is a free supply of lighter crudes.

Fuel oil is moving from the Los Angeles harbor at a figure considerably below the posted price of 85 cents.

Effective March 18, Standard Oil Company of California reduced the price of Elwood crude 24 cents per barrel on all grades between 34 and 42 gravity, inclusive, and abolished the price on lower gravities. This makes the price range from $1.16 to $1.64 per barrel. The same company has increased the tank wagon price of gasoline on the Pacific Coast six cents per gallon, or from 12½ cents to 18½ cents in Los Angeles territory. No service station price was set, but it probably will be the same as the tank wagon price because dealers all have contracts calling for a figure at least three cents under the tank wagon price, with some contracts running still lower.

Texas Buys Stored Oil From Southern Crude

San Angelo, Texas.—The Texas Company is reported to have contracted for approximately 2,400,000 barrels of Hendrick field crude held in storage by Southern Pipe Line Company at the latter's tank farm at Wickett, Ward County, at a flat price of 72½ cents per barrel in the tanks.

This oil will remain in storage, with the buyer paying a nominal monthly rental on same, until completion of The Texas Pipe Line Company's trunk line to the Gulf Coast about June 1.

Posted price of Hendrick field crude is 65 cents at the well, and 7½ cents per barrel premium being paid by The Texas Company hardly covers the expense involved in gathering and delivering the oil to the Wickett tank farm and loss involved in weathering the oil.

Southern Pipe Line Company is the crude marketing and transporting subsidiary of Pan-American Petroleum & Transport Company, which is in turn controlled by Standard Oil Company of Indiana. The former handles oil produced by Southern Crude Oil Purchasing Company, Dixie Oil Company and R. A. Westbrook Interests in West Texas. Standard of Indiana has heretofore been absorbing the bulk of this West Texas production.

Consulting Geologists Form Association

San Angelo, Texas.—Organization of The National Association of Consulting Geologists was perfected here at a meeting of geologists March 16, and the first business session will be held in Fort Worth during the annual convention of the American Association of Petroleum Geologists on March 21 to 23.

Officers of the new organization are all consulting geologists, with headquarters at San Angelo, and are as follows: Robert B. Campbell, president; V. E. Cottingham, vice-president; Robert L. Cannon, treasurer, and Robert F. Imbt, secretary.

United States Daily Average Production

Figures below are taken from the complete revised estimates of the AMERICAN PETROLEUM INSTITUTE except for the current week, which are advance estimates issued by the A. P. I. and are subject to revision:

1928	Oklahoma	Kansas	Texas (Outside Gulf Coast)	Gulf Coast	North Louisiana	Arkansas	Eastern States	Rocky Mountain	California	United States Daily Ave.	United Stases Total
January	675,450	108,300	523,300	125,450	45,250	90,050	109,600	77,000	617,100	2,371,500	73,516.500
February	664,450	110,550	538,750	115,800	45,300	88,250	104,850	75,550	614,750	2,358,250	68,388.850
March	646,850	112,250	575,850	119,900	44,400	85,600	102,150	78,700	617,450	2,383,150	73,877,650
April	620,450	112,150	617,850	118,850	46,900	83,450	107,000	78,500	613,550	2,398,700	71,961,100
May	610,100	108,750	561,450	129,850	43,600	91,250	112,100	82,200	630,900	2,370,200	73,476,300
June	594,850	105,200	554,400	135,400	42,350	102,850	109,300	82,400	643,400	2,370,150	71,104,500
July	587,150	102,750	597,250	133,650	42,150	90,700	113,400	80,400	644,700	2,392,150	74,156,600
August	656,350	102,200	604,000	130,200	40,200	87,500	113,300	77,700	634,150	2,445,600	75,534,600
September	724,850	99,750	604,150	129,500	39,050	84,700	112,550	78,850	631,650	2,505,050	75,151,500
October	741,350	97,900	598,550	129,950	38,800	83,550	114,000	83,300	624,450	2,511,850	77,867,800
November	715,750	96,600	586,350	135,100	38,600	83,000	109,700	81,150	653,050	2,499,300	74,978,300
December	710,600	97,200	603,700	135,050	37,300	81,350	113,450	74,600	697,850	2,551,100	79,084,400
1929											
January	722,550	97,150	632,500	136,750	36,650	78,600	111,950	73,200	747,250	2,635,600	81,703,600
Feb. 2	728,700	96,800	641,100	139,550	35,950	77,400	110,600	71,850	778,100	2,680,050	18,760,350
Feb. 9	728,350	95,700	640,550	143,500	35,700	77,250	109,600	72,950	789,900	2,693,550	18,854,850
Feb. 16	708,200	95,950	635,350	142,550	36,150	76,850	108,600	73,150	798,100	2,674,900	18,724,300
Feb. 23	703,400	95,500	656,250	142,400	35,700	76,100	107,850	68,750	808,200	2,694,150	18,859,050
Mar. 2	713,000	95,700	659,750	143,500	35,700	74,400	107,100	71,950	801,800	2,702,900	18,920,300
March 9	680,250	95,400	660,500	144,600	35,650	73,600	108,000	70,850	795,300	2,665,950	18,661,650
March 16	649,450	96,450	654,550	150,200	36,050	74,500	108,750	65,550	789,600	2,625,150	18,376,050
Increase	.....	1,050	.....	5,600	400	900	750	.....	.....	.....	.....
Decrease	30,800	.....	5,950	.....	.....	.....	.....	5,300	5,700	40,800	285,600

TEXAS

(Outside Gulf Coast)

PANHANDLE DISTRICT

	Mar. 16	Mar. 9
Carson County	5,700	5,900
Gray County	21,600	21,450
Hutchinson County	26,600	26,000
Wheeler County	650	500
Others	1,400	1,500
Total	55,950	55,350

NORTH TEXAS

Archer County	17,100	17,200
Burkburnett	9,100	9,150
Electra	12,800	12,950
Iowa Park-KMA	5,750	6,000
Montague and Cooke Cos.	10,000	9,750
Wilbarger	26,500	26,750
Others	500	500
Total	81,750	82,300

WEST CENTRAL TEXAS

Brown County	8,800	8,950
Callahan County	3,700	3,700
Coleman County	3,700	3,750
Eastland-Desdemona	6,700	6,700
Jack County	1,700	1,700
Palo Pinto County	400	400
Shackelford County	13,100	13,300
Stephens County	6,200	6,400
Throckmorton County	700	700
Young County	7,300	7,250
Others	700	700
Total	53,000	53,550

WEST TEXAS

Crane-Upton Counties	49,600	50,550
Crockett County	2,250	2,300
Howard County	45,900	47,300
Jones County	6,000	6,050
Mitchell-Scurry Cos.	2,900	2,750
Pecos County	87,100	86,550
Reagan County	18,500	18,600
Winkler County	166,600	171,000
Others	2,000	1,950
Total	380,850	387,050

EAST CENTRAL TEXAS

Boggy Creek	3,250	4,500
Corsicana-Powell	8,400	8,550
Currie	450	450
Mexia	5,600	5,600
Nigger Creek	600	600
Richland	400	400
Wortham	1,200	1,200
Total	19,900	21,300

SOUTHWEST TEXAS

Dale	700	800
Laredo District	12,000	12,500
Luling	12,550	12,200
Lytton Springs	1,100	950
Somerset	600	600
Salt Flat	31,050	28,400
Others	5,150	5,500
Total	63,150	60,950
T'tl Tex. (Outside Gulf Coast)	654,550	660,500

TEXAS GULF COAST

Barbers Hill	6,550	6,000
Batson	1,400	1,400
Big Creek	4,650	5,000
Blue Ridge	4,050	4,100
Boling	2,100	2,100
Damon Mound	700	700
Goose Creek	6,450	6,650
Hull	10,650	10,550
Humble	5,500	5,550
Orange County	3,150	3,000
Pierce Junction	12,850	11,700
Raccoon Bend	1,850	1,950
Saratoga	950	950
Sour Lake	2,800	2,900
South Liberty	6,750	6,000
Spindle Top	33,800	33,900
Sugar Land	9,300	8,050
West Columbia	7,000	7,000
Others	8,500	5,100
Total	129,000	124,500
Texas Total	783,550	785,000

OKLAHOMA

Braman	3,350	3,350
Logan County	11,550	11,800
Hubbard	2,000	1,950
Blackwell	3,850	4,100
Thomas	900	900
Tonkawa	10,100	10,550
Garber	5,300	5,250
Burbank	22,500	22,400
Osage (outside Burbank)	25,450	25,850
Cushing	20,850	20,500
Yale Jennings	7,200	7,600
Davenport	1,500	1,600
Bristow Slick	19,350	18,900
North Okmulgee	14,600	14,650
Lyons Deaner	8,400	8,450
Cromwell	7,700	7,800
Papoose	3,400	3,400
Wewoka	5,000	5,000
Seminole	30,700	33,400
Bowlegs	33,350	35,150
Searight	9,500	9,100
Little River	75,000	82,600
Earlsboro	52,650	56,750
Duncan District	6,600	6,950
Graham	4,400	4,400
Fox	1,450	1,500
Healdton	13,000	13,000
Hewitt	8,250	8,550
Scholem Alechem	12,750	13,000
Pearson	1,700	1,650
St. Louis	93,800	99,750
Allen	26,700	25,600
Maud	32,600	34,100
Mission	30,400	36,550
Okla. City	2,500	3,500
Others	41,100	40,650
Total	649,450	680,250

CALIFORNIA

Santa Fe Springs	175,000	186,000
Long Beach	185,000	183,000
Huntington Beach	46,500	47,000
Torrance	15,000	15,000
Dominguez	11,000	10,000
Rosecrans	6,500	6,500
Inglewood	26,500	26,500
Midway-Sunset	72,000	73,000
Ventura Avenue	55,500	56,500
Seal Beach	35,000	34,000
Elwood-Goleta	26,500	22,000
Kettleman Hills	3,400	3,500
Others	131,700	132,300
Total	789,600	795,300

KANSAS

Greenwood County	21,200	21,500
Florence-Covert	950	1,000
Peabody-Ebling	3,000	3,000
Eldorado-Towanda	12,000	12,000
Augusta-Fox Bush	2,850	2,900
Rainbow Bend	1,000	1,000
Russell	3,150	3,250
Churchill	7,100	7,050
Oxford	5,700	5,750
Sedgewick	10,900	9,150
Others	28,600	28,800
Total	96,450	95,400

NORTH LOUISIANA

	Mar. 16	Mar. 9
Homer	4,000	4,000
Haynesville	5,500	5,550
Caddo Light	8,400	8,450
Caddo Heavy	3,250	3,150
DeSoto-Red River	3,950	4,050
Elm Grove	600	600
Bellevue	650	650
Cotton Valley Light	3,000	2,950
Urania	6,000	5,600
Pleasant Hill	450	450
Others	250	200
Totals North Louisiana	36,050	35,650

LOUISIANA GULF COAST

Bayou Boullion	300	500
East Hackberry	6,900	5,000
Edgerly	1,000	800
Evangeline	800	800
Lockport	4,200	4,700
Sorrento	500	550
Sulphur Dome	2,100	2,000
Sweet Lake	400	450
Vinton	4,500	4,800
Others	500	500
Total Louisiana Gulf Coast	21,200	20,100
Louisiana Total	57,250	55,750

ARKANSAS

El Dorado	4,550	4,500
Champagnolle	9,750	8,450
Smackover Light	6,450	6,350
Smackover Heavy	49,850	50,450
Stephens	1,000	1,000
Nevada	1,350	1,300
Lisbon	1,500	1,450
Others	100	100
Total	74,500	73,600

MOUNTAIN STATES

WYOMING

Salt Creek	28,450	34,350
Grass Creek	2,150	2,250
Elk Basin	850	750
Big Muddy	2,350	2,250
Lost Soldier	3,500	3,500
Rock River	2,350	2,300
Lance Creek	300	300
Oregon Basin	2,550	3,000
Others	2,900	2,850
La Barge	2,050	2,050
Total	47,450	53,600

MONTANA

Cat Creek	1,350	1,350
Sunburst	5,450	5,400
Pondera	2,300	1,900
Total	9,100	8,650
Moffats (Craig)	1,050	1,150
Fort Collins	2,300	2,550
Florence	1,350	1,250
Others	2,050	2,050
Total	6,750	7,000

NEW MEXICO

Artesia	950	950
Hogback	500	500
Rattlesnake	700	....
Others	100	150
Total	2,250	1,600
Total Mountain States	65,550	70,850

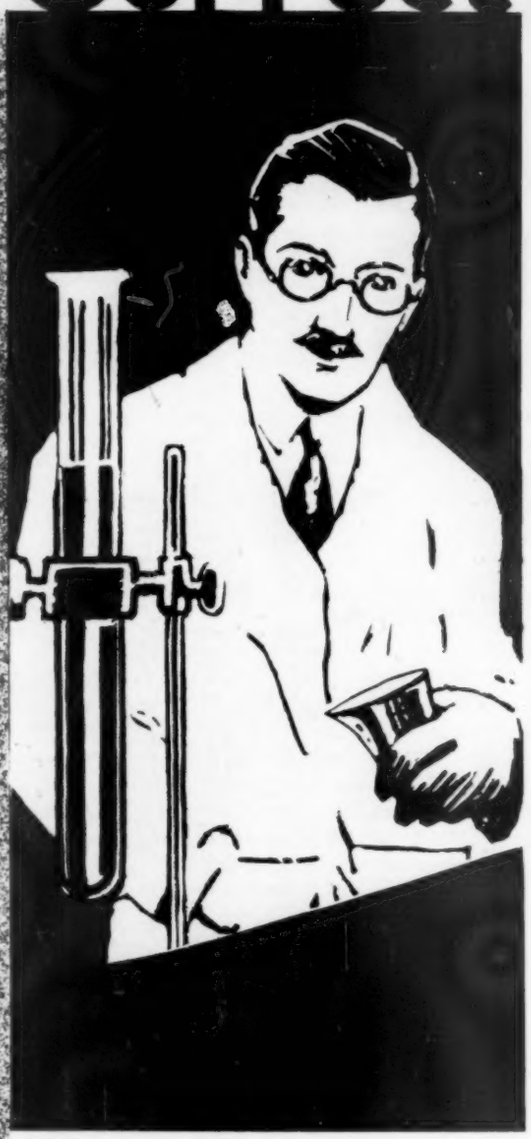
EASTERN STATES

(Including Ill., Ind., Ohio, W. Va., Pa., Ky., and N. Y.)	108,750	108,000

PRODUCTION SUMMARY

East of Rockies	1,770,000	1,799,800
Total U. S.	2,625,150	2,665,950

The Correct Formula



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PETRECO

Say you saw it in The OIL WEEKLY

CRUDE OIL PRICE QUOTATIONS

Revised March 19, 1929

CRUDE PRICE CHANGES

Effective March 18, Standard Oil Company of California reduced Elwood Crude 24 cents per barrel on all grades between 34 and 42 gravity, inclusive, and abolished the posted price on lower gravities. This makes the posted price on Elwood crude range from $1.16 to $1.64 per barrel, with a six-cent differential for each degree.

CURRENT POSTINGS

EASTERN STATES

(Effective March 12, 1929)

Penna Grade Oil in New York Transit Lines (New York)	$4.10
Brandford District Oil in National Transit Lines (Pennsylvania)	4.10
Penna Grade Oil in National Transit Lines (Pennsylvania)	4.00
Penna Crude Oil in Southwest Pennsylvania Lines (West Virginia)	4.00
Penna Grade Oil in Eureka Pipe Line Lines (Pennsylvania)	3.90
Penna Grade Oil in Buckeye Pipe Line Lines (Ohio)	3.85
Cabell Grade Oil in Eureka Pipe Line Lines (West Virginia)	1.35
Corning 35-cent Grade Oil in Buckeye Pipe Line Co.'s lines	1.80
Corning 25-cent Grade Oil in Buckeye Pipe Line Co.'s lines	1.75
Somerset Oil in Cumberland Pipe Line lines (Kentucky)	1.50
Ragland Grade Oil in Cumberland Pipe Line lines (Kentucky) (Effective Jan. 29, 1929)	.60
Keister (Pennsylvania)	1.20

CENTRAL STATES

(Effective January 25, 1929)
Posted by Ohio Oil Co.

Illinois	1.45
Indiana	1.27
Lima	1.50
Plymouth	1.18
Princeton	1.45
Waterloo	1.25
Wooster	1.62

WESTERN KENTUCKY

All grades	1.53

MID-CONTINENT

(Effective January 24, 1929)
Magnolia Petroleum Company

Under 26	.60
26 to 26.9 gravity	.65
27 to 27.9 gravity	.70
28 to 28.9 gravity	.75
29 to 29.9 gravity	.80
30 to 30.9 gravity	.90
31 to 31.9 gravity	1.00
32 to 32.9 gravity	1.08

From 33 to 44 gravity and above, Magnolia Petroleum Company prices are the same as those of Carter Oil Company.

MID-CONTINENT

(Effective January 25, 1929)
Carter Oil Company, Gulf Pipe Line Company, Sinclair Pipe Line Company, Prairie Oil and Gas Company and The Texas Company.

25 to 25.9gravity	.66
26 to 26.9 gravity	.72
27 to 27.9 gravity	.78
28 to 28.9 gravity	.84
29 to 29.9 gravity	.90
30 to 30.9 gravity	.96
31 to 31.9 gravity	1.02
32 to 32.9 gravity	1.08
33 to 33.9 gravity	1.11
34 to 34.9 gravity	1.14
35 to 35.9 gravity	1.17
36 to 36.9 gravity	1.20
37 to 37.9 gravity	1.23
38 to 38.9 gravity	1.26
39 to 39.9 gravity	1.29
40 to 40.9 gravity	1.32
41 to 41.9 gravity	1.35
42 to 42.9 gravity	1.38
43 to 43.9 gravity	1.41
44 and above	1.44

PANHANDLE

(Effective January 24, 1929)

GRAY COUNTY

(Humble Oil & Refining Company, Magnolia Petroleum Company, Gulf Pipe Line Company and Sinclair Pipe Line Company).

Below 29 gravity	.69
29 to 29.9 gravity	.75
30 to 30.9 gravity	.81
31 to 31.9 gravity	.87
32 to 32.9 gravity	.93
33 to 33.9 gravity	.96
34 to 34.9 gravity	.99
35 to 35.9 gravity	1.02
36 to 36.9 gravity	1.05
37 to 37.9 gravity	1.08
38 to 38.9 gravity	1.11
39 to 39.9 gravity	1.14
40 to 40.9 gravity	1.17
41 to 41.9 gravity	1.41
42 to 42.9 gravity	1.46
43 to 43.9 gravity	1.51
44 and above	1.56

WHEELER COUNTY

(Humble Oil and Refining Company and Magnolia Petroleum Company)

Below 30 gravity	.70
30 to 30.9 gravity	.76
31 to 31.9 gravity	.82
32 to 32.9 gravity	.88
33 to 33.9 gravity	.91
34 to 34.9 gravity	.94
35 to 35.9 gravity	.97
36 to 36.9 gravity	1.00
37 to 37.9 gravity	1.03
38 to 38.9 gravity	1.06
39 to 39.9 gravity	1.09
40 to 40.9 gravity	1.12
41 to 41.9 gravity	1.15
42 to 42.9 gravity	1.18
43 to 43.9 gravity	1.21
44 and above	1.24

CARSON-HUTCHINSON COUNTIES

(Humble Oil and Refining Company, Magnolia Petroleum Company and Gulf Pipe Line Company)

Below 32 gravity	.72
32 to 32.9 gravity	.78
33 to 33.9 gravity	.81
34 to 34.9 gravity	.84
35 to 35.9 gravity	.87
36 to 36.9 gravity	.90
37 to 37.9 gravity	.93
38 to 38.9 gravity	.96
39 to 39.9 gravity	.99
40 to 40.9 gravity	1.02
41 to 41.9 gravity	1.05
42 to 42.9 gravity	1.08
43 to 43.9 gravity	1.11
44 and above	1.14

WEST TEXAS

(Humble, Gulf, Magnolia, The Marland Company and Southern Crude Oil Purchasing Company)*

Crane-Upton, Crockett, Pecos and Winkler Counties, all grades	.65

*Gulf does not post in Winkler County; Magnolia posts in Crane, Upton and Winkler Counties. Southern Crude Oil Purchasing Company posts only in Crane, Upton and Winkler Counties.

CALIFORNIA CRUDE OIL PRICES AT THE WELL

(EFFECTIVE JANUARY 18, 1929)

Following are the current prices offered by Standard Oil Company for crude oil at the well: (Price per barrel of 42 gallons in fields indicated)

Gravity	Ventura *	Signal Hill	Alamitos Heights-Seal Beach	Huntington Beach	Inglewood	Olinda-Brea Canon	Athens-Rosecrans Dominguez	Elwood † Terrace	Torrance	Richfield	Whittier La Habra	Montebello	Coyote Hills	Santa Fe Springs	Newhall McKittrick Kern River	Midway-Sunset Elk Hills	Buena Vista Hills	Lost Hills	Coalinga	Wheeler Ridge
14-14.9	$ .85	$ .70	$ .70	$ .70	$ .70	$ .70	$ ..	$ ..	$ .70	$ .70	$ .70	$ .70	$ .70	..	$ .50	$ .50	$ .50	$ .50	$ .50	$ .50
15-15.9	.85	.70	.70	.70	.70	.70	..	..	.70	.70	.70	.70	.70	..	.50	.50	.50	.50	.50	.50
16-16.9	.85	.70	.70	.70	.70	.70	..	..	.70	.70	.70	.70	.70	..	.50	.50	.50	.50	.50	.50
17-17.9	.85	.70	.70	.70	.70	.70	..	..	.70	.70	.70	.70	.70	..	.50	.50	.50	.50	.50	.50
18-18.9	.85	.75	.75	.75	.75	.75	..	..	.75	.75	.75	.70	.75	..	.50	.56	.56	.56	.56	.56
19-19.9	.85	.80	.80	.80	.80	.80	..	..	.80	.80	.80	.75	.80	..	.50	.62	.62	.62	.62	.62
20-20.9	.85	.85	.85	.85	.85	.85	..	..	.85	.85	.84	.80	.84	..	..	.68	.68	.68	.68	.68
21-21.9	.86	.89	.89	.89	.89	.89	..	..	.89	.89	.88	.85	.88	.89	..	.74	.74	.74	.74	.74
22-22.9	.87	.93	.93	.93	.93	.93	..	..	.93	.93	.91	.90	.91	.92	..	.80	.80	.80	.80	.80
23-23.9	.90	.97	.97	.97	.97	.97	..	..	.97	.97	..	.95	.94	.95	..	.85	.85	.85	.85	.85
24-24.9	.94	1.01	1.01	1.01	1.01	1.01	1.01	..	1.01	1.01	..	.98	.97	.98	..	.90	.90	.90	.88	.88
25-25.9	.98	1.05	1.05	1.05	1.05	1.05	1.05	..	1.05	1.05	..	1.01	1.00	1.01	..	.95	.95	.95	.91	.91
26-26.9	1.02	1.09	1.09	1.09	1.09	1.09	1.09	..	1.09	1.09	..	1.04	1.04	1.04	..	1.00	1.00	1.00	.94	.94
27-27.9	1.06	1.13	1.13	1.13	1.13	1.13	1.13	..	1.13	1.13	..	1.07	1.08	1.07	..	1.05	1.05	1.05	.98	.97
28-28.9	1.10	1.17	1.17	1.17	1.17	1.17	1.17	..	1.17	1.17	..	1.10	1.12	1.10	..	1.10	1.10	1.10	1.02	..
29-29.9	1.14	1.21	1.21	1.21	..	1.21	1.21	..	..	1.21	..	1.13	1.16	1.15	..	1.16	1.16	1.16	1.06	..
30-30.9	1.18	1.25	1.25	1.25	..	1.25	1.25	..	..	1.25	..	1.16	1.20	1.20	..	1.22	1.22	1.22	1.10	..
31-31.9	1.23	1.30	1.30	1.30	..	..	1.30	..	..	..	..	..	..	1.25	..	1.28	1.28	1.28	1.14	..
32-32.9	1.28	1.35	1.35	1.35	..	..	1.35	..	..	..	..	..	..	1.30	..	1.34	1.34	1.34	1.18	..
33-33.9	..	..	..	..	..	..	1.41	..	..	..	..	..	..	1.35	..	1.40	1.40	1.40	1.22	..
34-34.9	..	..	..	..	..	..	1.47	1.16	..	..	..	..	..	1.40	..	..	..	1.46	1.26	..
35-35.9	..	..	..	..	..	..	1.53	1.22	..	..	..	..	..	1.45	..	..	..	..	1.30	..
36-36.9	..	..	..	..	..	..	1.59	1.28	..	..	..	..	..	1.50	..	..	..	..	..	..
37-37.9	..	..	..	..	..	..	1.65	1.34	..	..	..	..	..	1.55	..	..	..	..	..	..
38-38.9	..	..	..	..	..	..	1.71	1.40	..	..	..	..	..	1.60	..	..	..	..	..	..
39-39.9	..	..	..	..	..	..	1.77	1.46	..	..	..	..	..	1.65	..	..	..	..	..	..
40-40.9	..	..	..	..	..	..	1.83	1.52	..	..	..	..	..	..	..	..	..	..	..	..
41-41.9	..	..	..	..	..	..	1.89	1.58	..	..	..	..	..	..	..	..	..	..	..	..
42-42.9	..	..	..	..	..	..	1.95	1.64	..	..	..	..	..	..	..	..	..	..	..	..

KETTLEMAN HILLS—55 degree Gravity and above $1.65 per barrel. *Union Oil Company. †Changed March 18, 1929.

CRUDE OIL PRICE QUOTATIONS (*Continued from Page 47*)

(Magnolia Petroleum Company)
(Effective January 24, 1929)

Mitchell County	$ .65
Howard-Glasscock County (shallow)	.65
Howard-Glasscock County (deep)	.65

Col-Tex Refining Company

Howard and Mitchell Counties	$ .80

MARKHAM
The Texas Company
(Effective January 30, 1929)

All grades	.90

LULING

All grades	.80

NORTH AND CENTRAL TEXAS
Effective January 24, 1929)
Ranger, North Texas, Mexia, Powell, Richland, Wortham, Currie, Moran, Nocona and Lytton Springs Crude
(Humble Oil and Refining Company)

Below 25	.60
25 to 25.9 gravity	.66
26 to 26.9 gravity	.72
27 to 27.9 gravity	.78
28 to 28.9 gravity	.84
29 to 29.9 gravity	.90
30 to 30.9 gravity	.96
31 to 31.9 gravity	1.02
32 to 32.9 gravity	1.08
33 to 33.9 gravity	1.11
34 to 34.9 gravity	1.14
35 to 35.9 gravity	1.17
36 to 36.9 gravity	1.20
37 to 37.9 gravity	1.23
38 to 38.9 gravity	1.26
39 to 39.9 gravity	1.29
40 to 40.9 gravity	1.32
41 to 41.9 gravity	1.35
42 to 42.9 gravity	1.38
43 to 43.9 gravity	1.41
44 and above	1.44

SOUTH TEXAS

Mirando and Salt Flat	.80

GULF COAST
(Effective January 26, 1929)

Grade "A" all companies	1.20
Gulf Coast Light Oil, below 25	1.05
25 to 25.9 gravity	1.07
26 to 26.9 gravity	1.09
27 to 27.9 gravity	1.11
28 to 28.9 gravity	1.13
29 to 29.9 gravity	1.15
30 to 30.9 gravity	1.17
31 to 31.9 gravity	1.19
32 to 32.9 gravity	1.21
33 to 33.9 gravity	1.23
34 to 34.9 gravity	1.25
35 to 35.9 gravity	1.27
36 to 36.9 gravity	1.29
37 to 37.9 gravity	1.31
38 to 38.9 gravity	1.33
39 to 39.9 gravity	1.35
40 and above	1.37

*Humble Oil & Refining Company's postings on Gulf Coast Light stop at 35 to 35.9. Its price on all crudes above 35 to $1.37 per barrel.

Magnolia Petroleum Company's postings stop at 31 to 31.9.

SOMERSET
Grayburg

Below 33 gravity	1.05
33 to 33.9 gravity	1.07
34 to 34.9 gravity	1.09
35 to 35.9 gravity	1.11
36 to 36.9 gravity	1.13
37 to 37.9 gravity	1.15
38 and above	1.17

WYOMING-MONTANA
(Effective January 25, 1929)
Wyoming

Byron	1.33
Ferris	1.60
Elk Basin	1.36
Grass Creek	1.36
Rock Creek	1.18
Lost Soldier	.95
Lance Creek	1.38
Mule Creek	1.10
Notches	.65
Big Muddy	1.28
Osage	1.38
Hamilton Dome	.85
Pilot Butte	1.75
Torchlight-Greybull	1.48
Lander	.80
Rex Lake	1.10
South Casper Creek-Poison Spider	1.00

Salt Creek
Midwest Refining Company

29 to 29.9 gravity	.90
30 to 30.9 gravity	.96
31 to 31.9 gravity	1.02
32 to 32.9 gravity	1.08
33 to 33.9 gravity	1.11
34 to 34.9 gravity	1.14
35 to 35.9 gravity	1.17
36 to 36.9 gravity	1.20
37 and above	1.23

MONTANA

Sunburst	$1.65
Cat Creek	1.48
Lake Basin	2.20

NEW MEXICO

Artesia	1.08
Hogback	1.43

CANADA
(Effective January 26, 1929)

Oil Springs	1.97
Petrolia	1.90

LOUISIANA-ARKANSAS
(Effective January 26, 1929)
Homer, Haynesville, Caddo, El Dorado, De Soto and Crichton and Cotton Valley*
(Atlantic Oil Producing Company, Standard of Louisiana, Magnolia Petroleum Company and The Texas Company.)

27 to 27.9 gravity	.78
28 to 28.9 gravity	.84
29 to 29.9 gravity	.90
30 to 30.9 gravity	.96
31 to 31.9 gravity	1.02
32 to 32.9 gravity	1.08
33 to 33.9 gravity	1.11
34 to 34.9 gravity	1.14
35 to 35.9 gravity	1.17
36 to 36.9 gravity	1.20
37 to 37.9 gravity	1.23
38 to 38.9 gravity	1.26
39 to 39.9 gravity	1.29
40 to 40.9 gravity	1.32
41 to 41.9 gravity	1.35
42 to 42.9 gravity	1.38
43 to 43.9 gravity	1.41
44 gravity and above	1.44

*Shreveport-Eldorado's postings stop at above 40 gravity.

The posting on Cotton Valley is same as Caddo. From 36 to 52 and above the regular gravity schedule is followed.

The Texas Company pays North Texas gravity scale in North Louisiana.

STEPHENS
(All Companies)

Below 28 gravity	.70
28 to 28.9 gravity	.74
29 to 29.9 gravity	.78
30 to 30.9 gravity	.82
31 to 31.9 gravity	.86
32 gravity and above	.90

SMACKOVER
(All Companies)

Below 24 gravity	.75
24 and above	.90
Bellevue	1.25
Jennings	1.15
Vinton	1.30
Edgerly	1.30
Starks Dome	1.30
Urania	.85
Calion	.75

IMPORTS OF PETROLEUM AT PRINCIPAL UNITED STATES PORTS
American Petroleum Institute Figures (Barrels of 42 Gallons)

	Week Ended March 9	Week Ended March 2
AT ATLANTIC COAST PORTS—		
Baltimore	244,000	70,000
Boston	212,000	72,000
New York	877,000	818,000
Philadelphia	294,000	271,000
Others	143,000	.....
Total	1,770,000	1,231,000
Daily Average	252,857	175,857
AT GULF COAST PORTS—		
Galveston District	.....	.....
New Orleans and Baton Rouge	154,000	*535,000
Port Arthur and Sabine District	.....	23,000
Tampa	.....	.....
Total	154,000	558,000
Daily Average	22,000	79,714
AT ALL UNITED STATES PORTS—		
Total	1,924,000	1,789,000
Daily Average	274,857	255,571
Daily Average Four Weeks Ended	237,393	249,286

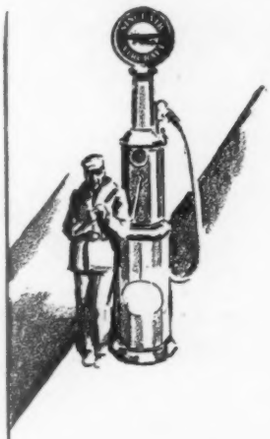
RECEIPTS OF CALIFORNIA OIL AT ATLANTIC AND GULF COAST PORTS
American Petroleum Institute Figures (Barrels of 42 Gallons)

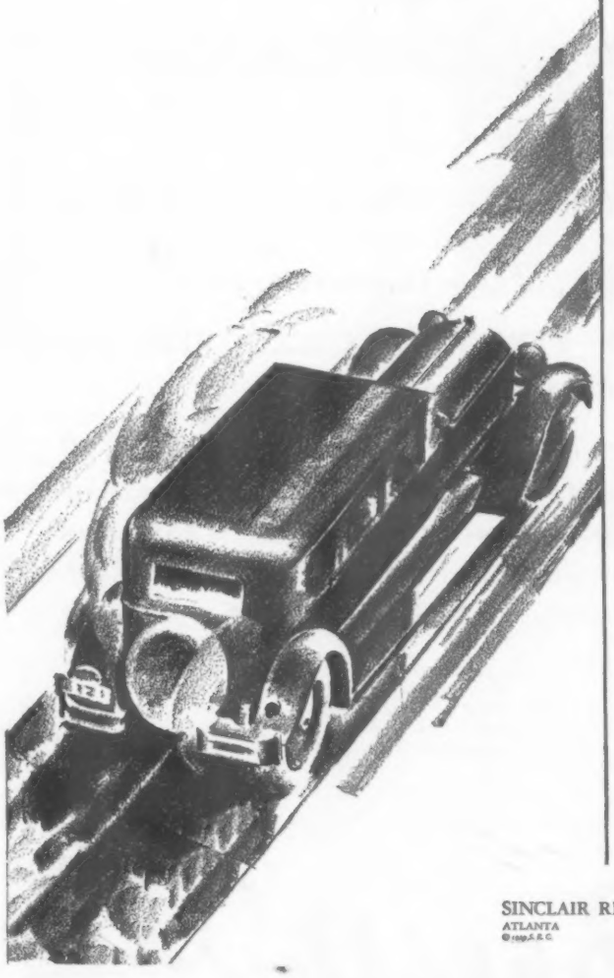
	Week Ended March 9	Week Ended March 2
AT ATLANTIC COAST PORTS—		
Baltimore	.....	252,000
Boston	.....	.....
New York	230,000	363,000
Philadelphia	135,000	95,000
Others	.....	78,000
Total	365,000	788,000
Daily Average	52,143	112,571
AT GULF COAST PORTS—		
Total	.....	75,000
Daily Average	.....	10,714
AT ATLANTIC AND GULF COAST PORTS—		
Total	365,000	863,000
Daily Average	52,143	123,285
Daily Average Four Weeks Ended	73,393	86,464
Distrubtion of Total California Oil Receipts is as follows:		
Crude	.....	175,000
Gasoline	287,000	517,000
Gas Oil	78,000	96,000
Kerosene	.....	75,000
Total	365,000	863,000

*Revised.

JUNE *is far away*

...but SUMMER ENGINE PERFORMANCE IS YOURS TODAY!..AT ANY *Aircraft* PUMP!





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PERSONAL MENTION-MEN YOU KNOW

Joe W. Elsbury, formerly chief scout for the Marland Production Company in the Texas division and now an independent operator with headquarters at Houston, was a business visitor in Fort Worth late last week.

Carl Lumpkin, manager of the Tulsa land office of the Marland Production Company, has resigned effective April 1, and plans to enter the brokerage business.

Frank Dalton, general manager of D & M Machine Works, Lomita, California, early in March left for a tour of the Mid-Continent oil fields.

Harry H. Hillman, who has served for several years as president and general manager of the National Supply Company of California, with headquarters in Los Angeles, has resigned and effective March 11 was elected president of Hillman-Cooney, Inc., 2439 Hunter Street, Los Angeles. J. M. Hillman is vice-president of Hillman-Cooney Inc., while J. Grover Kelley, formerly assistant secretary-treasurer and credit manager of National Supply Company, is now secretary-treasurer. Earl Covel is handling pipe sales. Mr. Hillman's successor at National Supply Company has not been announced.

E. S. Ford, president of Ford Oil Tool Company, Los Angeles, accompanied by Milton Brennan, in charge of sales for the Ford Oil Tool Company in the Mountain States, left Los Angeles, March 16 overland for a trip through the oil fields of Texas, Oklahoma and probably Arkansas and Louisiana. Mr. Ford expects to return to Los Angeles headquarters about April 1.

L. E. Thomas, president of Reading Iron Company, has returned to Reading headquarters from a business trip of two weeks through the Texas and Oklahoma oil country.

University of Southern California announces the following practical evening courses will open at University College, 122 East 7th street, Los Angeles, at 7 p. m. on the dates named:

Petroleum Technology, March 18; Petroleum Geology, March 19; Petroleum Engineering, March 20.

The first lectures of each course on the nights named are open to the public. Those wishing to register may do so at that time, or at the second meeting of the groups during the week of March 25. Each evening class will meet once a week for 12 weeks.

To South America

J. W. STEELE

J. W. Steele, supervisor of the mineral leasing division of the United States Geological Survey, with headquarters in Casper, Wyoming, is one of the two men chosen to go to Colombia, S. A., to advise that government on the reconstruction of its petroleum laws. With him will go H. Foster Bain, formerly director of the United States Bureau of Mines and now secretary of the American Institute of Mining and Metallurgical Engineers. Steele and Bain will be absent from the United States 10 weeks or more.

Steele is a graduate of the Michigan College of Mines at Houghton, and he has had practical mining experience in Canada, the United States and Mexico. In 1914 Steel changed from mining to petroleum engineering, and started as a roustabout in the Cushing field in Oklahoma. In 1918 he came to Wyoming as general manager for the old Wind River Refining Company at Riverton, and a year later joined Producers & Refiners Corporation as field and production superintendent in charge of that company's black oil fields near Lander and its gas production at Sand Draw. He associated himself with the United States Bureau of Mines in 1922, where he was assistant deputy supervisor of the mineral leasing division. Work of the bureau was transferred to the United States Geological Survey in 1925, and Mr. Steele became supervisor.

Charles S. Jones, vice-president and treasurer of the Rio Grande Oil Company, with headquarters in Los Angeles, was slightly injured in an automobile accident in New Mexico while enroute El Paso to attend annual meeting of the company. He suffered fracture of one rib and was bruised up a little. He stopped over in El Paso for a few days and then continued a previously contemplated business trip to Eastern points.

V. L. Ehrenclou, who heads the publicity and advertising department of the Union Oil Company of California, with headquarters in Los Angeles, is rejoicing over the arrival of a first born, a daughter, who made her bow February 21. Mother and child are doing fine, and the father has lost most of his boyish ways.

S. H. Keoughan of Denver, president of the Continental Oil Company, spent some time in Los Angeles and Southern California in March, conferring with officials of the company in California and watching the wildcat at Carpenteria, which many expect to prove up a new field.

James S. Watson has recently been elected vice-president of Link-Belt Company and will maintain headquarters at the company's Dodge Works, Indianapolis, Indiana. He has been located at this plant for the past nine years, and prior to his recent promotion was general manager in charge of the production of Link-Belt silent and roller chain drives. He will continue to be responsible for the sale of these drives and Herringbone Speed Reducers, through a band of power transmission engineers located in practically all of the principal cities.

Mr. Watson was born in Philadelphia, and has been connected with Link-Belt Company for 34 years. He was selected by the management in January, 1903, to take charge of the exploitation of Link-Belt silent chain as a power transmitting medium.

R. M. Sands has been named assistant to the president of the Petroleum Securities Company. Mr. Sands has been closely identified with E. L. Doheny who controls the company for more than 15 years.

Los Angeles.—Ohio Oil Company, recent entry into California, has located a wildcat near Venice, and about four miles southwest of the Inglewood field. The test lines up roughly with the Torrance and Lawndale fields.

Veteran Employes Take Official Places With Magnolia

DALLAS, Texas.—Three new directors and officers were elected from the ranks of veteran employes during the annual meeting here March 12 of the Magnolia Petroleum Company and Magnolia Pipe Line Company, which are owned by Standard Oil Company of New York, except for qualifying shares of stock held by directors of the former concerns. The three new members placed on the board of directors were also elected by the board to active executive positions. They are as follows: E. P. Angus, vice-president and general sales manager, succeeding A. C. Ebie, who retired more than a year ago because of failing health; Ralph H. Kinsloe, vice-president; and D. A. Little, assistant general manager. All former directors and officers were re-elected, excepting Ebie, and the Texas charter of the two concerns has been amended to increase number of directors from 11 to 13.

All directors and officers of the Magnolia companies are residents of Dallas, Beaumont and Galveston, and as vacancies occur, the ranks are filled with employes that have had long active service with the companies, although Standard of New York has held 70 per cent of the stock since 1918, and 100 per cent. except for directors' qualifying shares, since 1925. Chairmanship of the board of directors has been left vacant since the death of John Sealy in February, 1926.

Director and Assistant General Manager

D. A. LITTLE

Director and Vice-President in Charge of Sales

E. P. ANGUS

Angus is a native Texan, born in Corsicana, where he spent his youth. His business career has been restricted to the services of two oil companies. The first connection was made with a pioneer oil concern in Corsicana in the early 90's, followed by a transfer to a branch office at Dallas in 1902. He served in the marketing division of that concern until January 1, 1912, when connection was made with the Dallas sales division of the Magnolia Petroleum Company. Angus has been assistant general sales manager of Magnolia Petroleum Company for a number of years, and during the past year has been in charge of the department, as acting manager.

Kinsloe is one of the oldest employees of Magnolia Petroleum Company in service, having had active service in the refining branch for nearly 25 years. After graduating from Texas A. & M. College in 1903 and finishing a post graduate course in mechanical engineering, he entered in 1904 the services of the Navarro Refining Company, a Corsicana concern that was then being operated by officials now at the head of the Magnolia Petroleum Company, and transferred to Beaumont in 1913 to become assistant manager of the refining department of Magnolia Petroleum Company. This position was held by Kinsloe at the time of his promotion to the general offices of the company at Dallas in August, 1928.

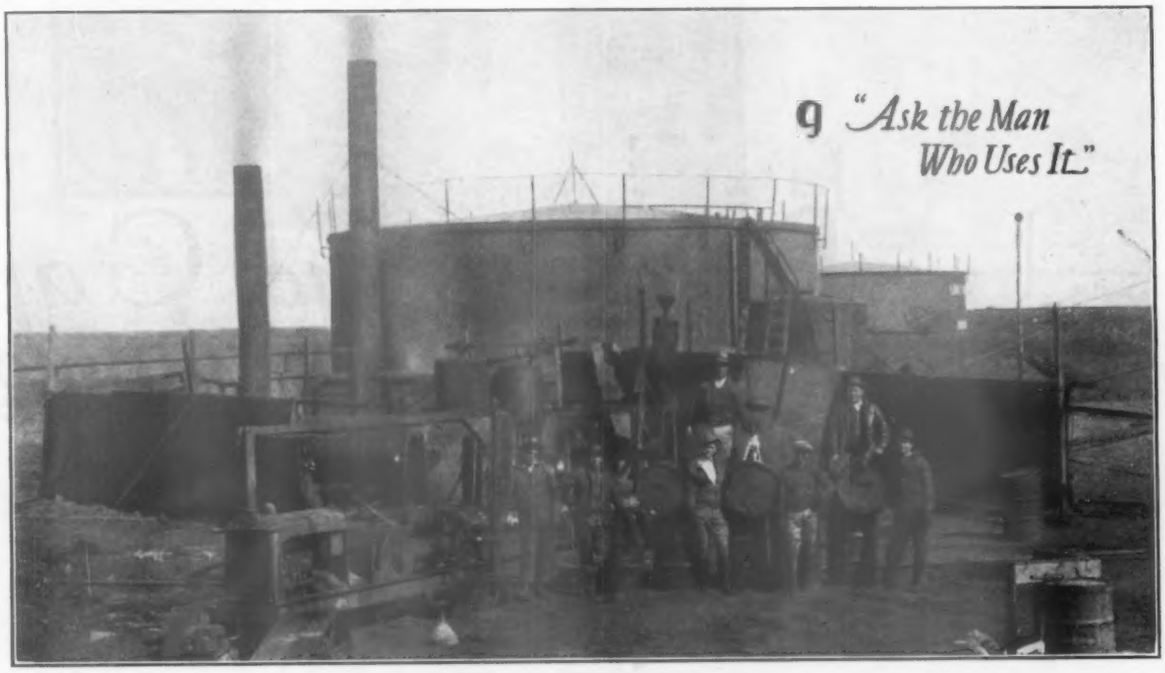
Little is also a native of Corsicana, having been educated in the public schools of the town while the original Magnolia company was getting itself established in the petroleum world from nearby shallow oil production. He became associated with Magnolia Petroleum Company in March, 1914, starting in the accounting department, and when headquarters of the company were transferred to Dallas in June of the same year he was included in those moved. Little became assistant treasurer of the company in 1923, and was transferred to the executive offices in February, 1928. In addition to being a director, he will be first assistant to B. H. Stephens, vice-president and general manager.

Director and Vice-President

RALPH H. KINSLOE

VEZ Treats Cut Oil . . .

at Initial Boiling Point of the Crude



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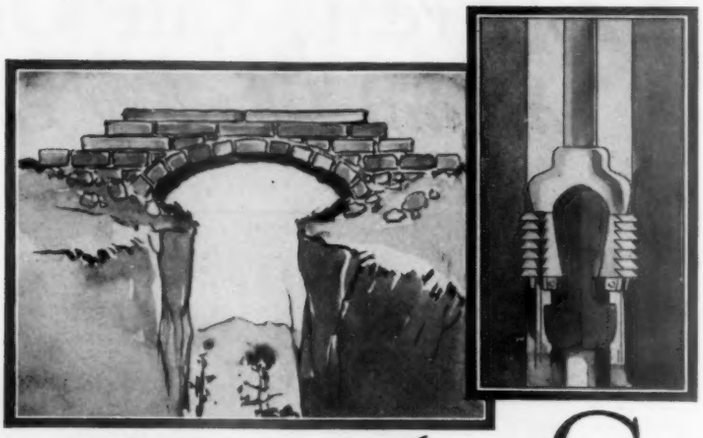

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News From California Fields

BRAD MILLS, *Staff Representative, Los Angeles, California*

Santa Fe Production Takes Further Tumble

LOS ANGELES.—The rapid decline of the 117 deep sand producers and the failure of the Buckbee zone to maintain the sizzling pace it set during January and February resulted in a sharp decline at Santa Fe Springs during the week. Eight completions boosted production only 12,500 barrels, while the decline from the more settled wells totaled almost 30,000 barrels. The field suffered a net loss of about 17,000 barrels, production slipping to 167,000 barrels at the end of the week.

Danger of a new peak from the Buckbee zone has definitely passed, a field survey indicating that completions will be scattered over a long period. Average initial production of the eight completions last week was 1563 barrels, or the lowest average for three months.

Many edge wells are gradually showing a larger percentage of water, especially in the south and west sectors. The inside wells are not showing high cuts, except in instances where water was present at the time of completion. Several Buckbee zone wells, which came in flowing at a low rate, are being placed on the pump. In the southeast part of the field and just south of some of the best leases, many wells have failed to flow when first tested. These failures were largely responsible for the turn downward. Several small producers in the southwest part of the field are declining rapidly, adding to the number of wells that will soon be placed on the pump.

O'Connell and Clarke Zones

Following the decline of the Buckbee zone, attention has been turned to the O'Connell and Clarke zones, none of which has had a satisfactory test. It has been proved that the O'Connell and Upper Clarke sands are an unbroken body near the center of the field, unless a streak of shale may be regarded as an indefinite break. In the discovery well in the latter, and in other edge wells which have found the zone, the O'Connell sand was not found at all, proving that the Clarke sand is much larger, even if thinner, than either the Buckbee or O'Connell zones. Geologists have been busy correlating wells that have cut both deep zones, and it is practically assured that the O'Connell and Upper Clarke sands will be produced over a wide area with one string of casing.

California Eastern Oil Company will be the first operator to attempt to produce both the O'Connell and Upper Clarke zones at one time. The company will include the lower part of the O'Connell sand and as nearly as possible all of the Upper Clarke sand in Santa Fe 1, which will be drilled to 7025 feet. A string of casing will be cemented at 6665 feet for the test. Suspicious looking streaks of sand in the upper part of the O'Connell and the fact that the discovery well produced water from the top of the zone led the company to take such a precaution. While not a center well, Santa Fe 1 should help to prove the value of both the O'Connell and Upper Clarke zones, and in addition will prove the wisdom of using only one shutoff for the two zones. The well failed to produce in the Buckbee sand.

Universal Consolidated Oil Company is cementing a string of casing at 6372 feet to test the entire O'Connell zone. The well was drilled to 6712 feet and is expected to throw additional light on the source of water in the discovery well.

Shell Oil Company will test the upper O'Connell in Slusher B-1, which is located in an area that failed to produce satisfactorily in the Buckbee zone. A string of 6⅝-inch casing has been cemented at 6430 feet, with the hole bottomed at 6525 feet. If the zone is productive at this point, it may be possible to complete many wells which failed in the Buckbee zone.

Eight wells have found the Upper Clarke zone, and of this number three have drilled completely through it. The depth of the sand ranges from 50 feet to 125 feet, depending upon the location of the wells. The formation has had a tendency to thicken very slowly when traced in from the edge of the field. General Petroleum Corporation found the sand to be 90 feet thick in No. 228, a test in the east part of the field. This well found the zone at 6962 feet. Although regarded as only a small producer at best, the sand has proved to be the most uniform zone found below the Meyer. If taken in conjunction with the O'Connell, it may become a major factor in future production of the entire field. Cores revealed a light oil and a good gas content.

The zone proved to be the thinnest in Associated Oil Company's Dallugge 7, located in the extreme northern part of the field, where only 37 feet of sand was found. This well will be continued to the Lower Clarke zone.

South Part Doubtful

The south part of the field assumed a still more doubtful position in the Buckbee zone, four wells having failed to flow when tested. Two of these wells will be placed on the pump, while two will be plugged back to produce in the Meyer sand.

The Upper Clarke will soon be tested near the center of the field, with George F. Getty's O'Connell 21 cemented at 6927 feet. The well was drilled to 7030 feet and includes nearly all of the sand. This is regarded as a representative test of the formation and should reveal the future of the thin sand.

Due to the limited knowledge of drilling conditions in the O'Connell zone, at least two weeks will be required to test the key wells in this sand. Corresponding roughly to the Buckbee zone, the sand is variously estimated as good for from 50,000 to 150,000 barrels of flush production.

Associated Oil Company has cemented a string of casing at 7802 feet in Clarke 2, discovery well in the Lower Clarke zone. The well was drilled to 7922 feet and tapped the deepest zone ever found in California. The formation was about evenly divided between oil sand and brown shale. The casing was landed without mishap, followed by 400 sacks of cement. If successful, the well will be the first producer from the Miocene in the field.

The number of drilling wells has shown little change during the week, now standing at 177. Of this number 50 are drilling above the Meyer sand, 20 between the Meyer sand and 5000 feet, 42 between the Buckbee and Upper Clarke sands and one below the Upper Clarke

zone. One well is ready to complete in the Nordstrum zone and 10 cemented over and five ready to complete in the Buckbee zone. Idle drilling wells have declined to 30, idle rigs to 14, with active locations standing at 28. Many of the idle wells will be started when the status of the O'Connell zone is known. Wells producing in the Buckbee and Nordstrum zones total 117, the average production having declined to around 1300 barrels.

General Petroleum Corporation maintained its lead in the field, with the completion of two wells and the re-completion of another. The best of the trio was Santa Fe 206, which came in with an initial production of 2800 barrels from 5825 feet. Santa Fe Community 1 made a very poor showing in the Nordstrum zone, showing a gross production of 2000 barrels, of which 80 per cent was water. Hill-Midway 2, deepened further into the Buckbee zone, responded with a new initial production of 2000 barrels of clean oil. The well was drilled to 5940 feet and included all of the sand.

Standard Oil Company completed Koontz 2 with an initial production of only 200 barrels. The oil showed a cut of 35 per cent. The Buckbee zone has not proved very productive in this part of the field.

The Texas Company successfully completed Weaver 4 and Wickman 3 during the week, and while not unusually large wells, the oil was much cleaner than in the average completions. Weaver 4 came in with an initial production of 800 barrels from 5872 feet, with Wickman 3 showing a flow of 1100 barrels. The cut in both wells was below one per cent.

Other completions were A. L. Marsten's No. 2, an 1100-barrel producer in the Nordstrum zone at 5300 feet, and Bandini Petroleum Company's Off 8, a 1600-barrel re-completion at 5885 feet.

Two at Ventura

Ventura, Calif.—Completion of two wells during the week in the Ventura field added only a small amount of production, but served to offset the natural decline. Shell Oil Company completed Taylor 27, with an initial production of 800 barrels. The well was drilled to 6695 feet, or a considerably shallower depth than the average completions of past months. The oil showed a cut of 30 per cent., and much lower gravity than the cleaner wells.

Pacific Western Oil Company's Willet 4, completed at 7210 feet with an initial production of only 100 barrels, was a disappointment from almost every angle. The well showed a very high water cut and a low gravity.

Several wells, which are intended to extend the field, have passed the level at which production was expected, but may prove successful at still greater depths.

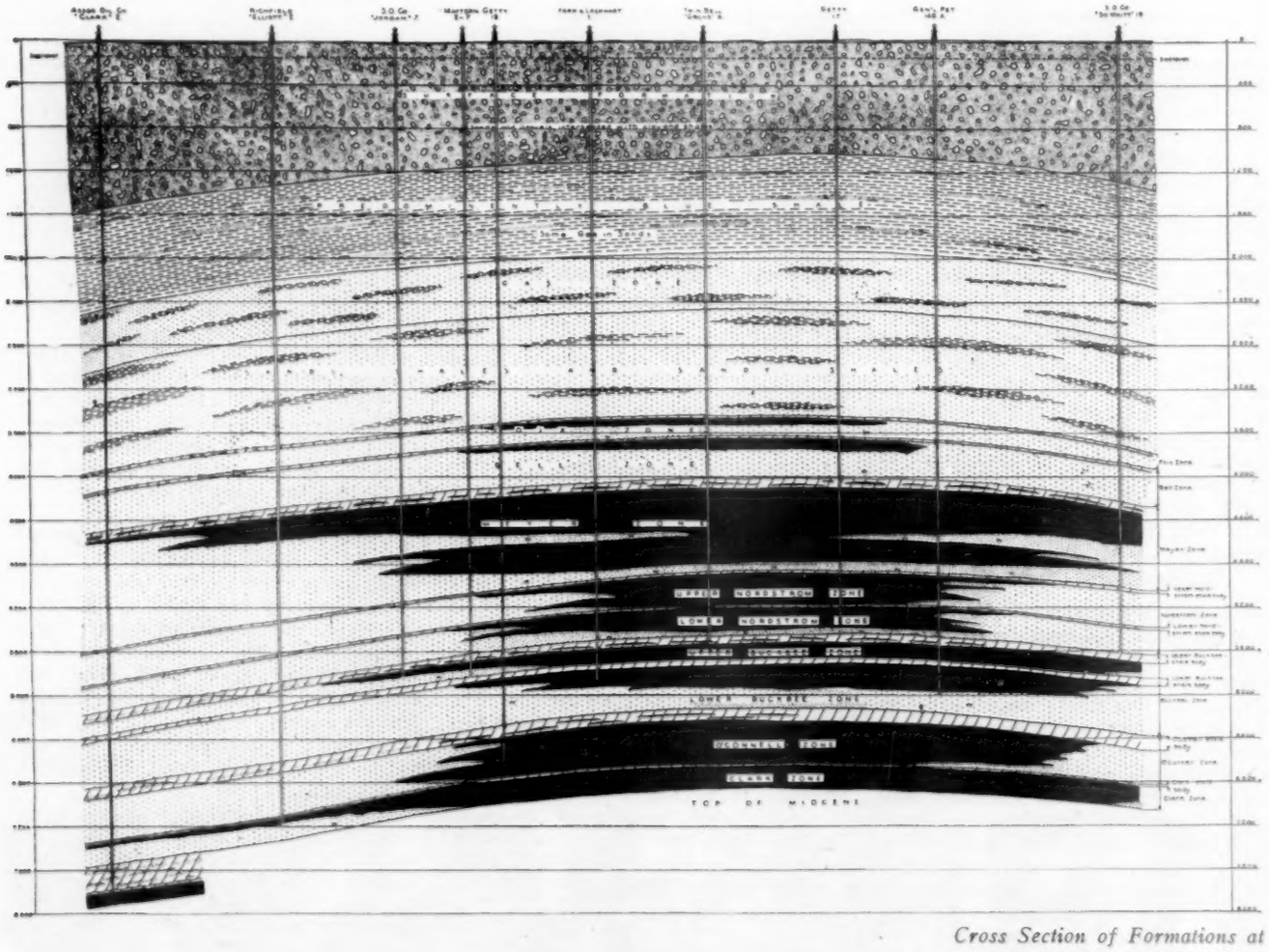
Too Many Tests Below Sand Level at Lawndale

Los Angeles, Calif.—A still more doubtful status was placed on the Lawndale field, as the result of an unsuccessful production test in J. E. O'Donnell's No. 77. The well was drilled to 5900 feet, a string of 6⅝-inch casing cemented at 5825 feet, and a successful water shutoff obtained above the oil sand. After drilling out the cement, the well failed to flow.

A survey of the field shows five wells drilling below 6000 feet, all being considerably deeper than the level at which production was expected. Superior Oil Company has passed 6400 feet in Ritter 1, considered as a representative location, but only thin streaks of oil sand have been found. The company is drilling at 6050 feet in Security 1, with the formation running to hard sand and occasional thin streaks of oil sand.

Standard Oil Company cut about 20 feet of oil sand between 6200 feet and 6225 feet and will run a string of casing for a production test. This thin body of sand is not expected to make a large well.

Failure to find the trend of production at Lawndale parallels the early development of other Los Angeles Basin fields, after the discovery wells were completed. There seems to be a feath-



Cross Section of Formations at

ering out of the oil sands in the Lawndale field and the producing area probably will be narrow. The discovery well is west of present development, making it possible that the field will lie northwest and southeast of the producing wells.

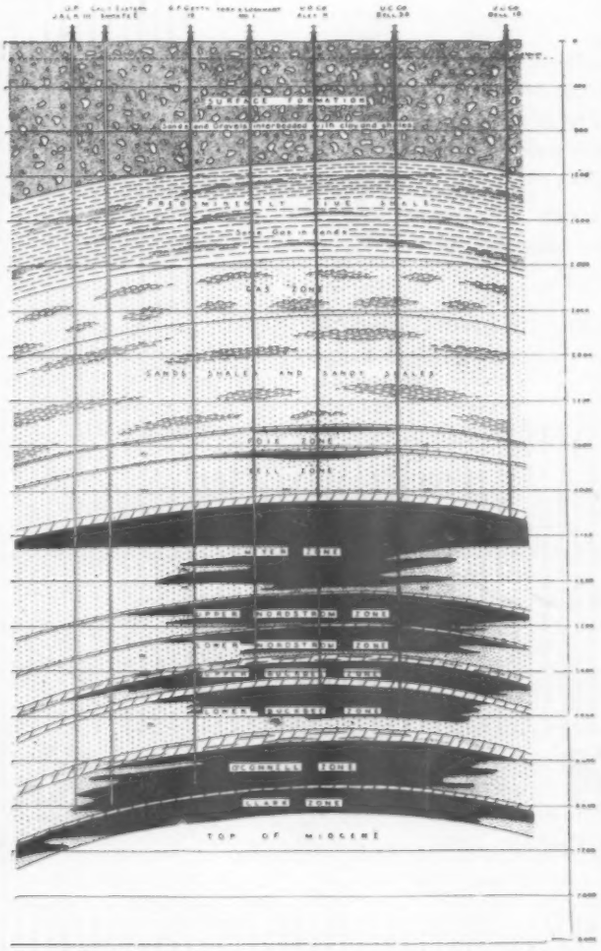
Kettleman Hills Activity Shows Increase

Coalinga, Calif.—While activity in the Kettleman Hills field is showing a weekly increase, it will require the completion of another well to bring the area to a peak of drilling operations. General Petroleum Corporation is testing the final shutoff in Oeschner 2, now the deepest drilling well in the field and expected to be the next completion. The well is standing at 6515 feet, or about 600 feet above the top of producing zone.

Standard Oil Company is drilling below 4800 feet in No. 81, the deepest well started since the completion of the discovery well several months ago. The company is drilling six additional wells.

George F. Getty is making fast time in Armstrong 1, having passed 4500 feet. The formation is tough shale and drilling has become slow.

Other companies with wells drilling below 3000 feet are Marland Oil Company, Milham Exploration Company, discoverer of the field, and Shell Oil Company.



Santa Fe Springs

Standard of California Earnings Increased

San Francisco.—The annual statement of the Standard Oil Company of California shows a new profit, after providing for depreciation, depletion and taxes, of $45,083,817.55, or $3.66 per share, as compared with a net profit during 1927 of $40,210,952.69, or $3.16 per share, an increase of 14.61 per cent. A total of $19,996,260.47 was allowed for depreciation, depletion and amortization and $3,554,000.00 for Federal income tax, giving the company a gross earning of $69,634,078.02. The cash position, plus marketable securities, stood at $37,642,937.04 at the end of the year, an increase of $11,052,291.91. At the close of the year, the company owned in fee or had under lease 1,046,527 acres in the United States and nearly 950,000 acres in Colombia, Mexico and Venezuela.

La Crosse Deep Test

Ventura.—The old La Crosse field, four miles north of the Ventura Avenue field, is to have a deep test drilled immediately by the California Ventura Oil Company. The derrick is completed and the well will be spudded in about 10 days.

California Ventura Oil Company, operating a 640 acre lease, is obtaining its present production from a number of old shallow wells (600 feet to 1200 feet deep), producing from a small, steeply folded, anticline in the Monterey.

Geologists have believed for some time that this Monterey has been thrust over the entire series of Lower Pico sediments, which comprises the producing measures of the Ventura Avenue and Rincon fields, and that the source of this shallow production is seepage from these underlying Lower Pico beds. This hypothesis is substantiated by the recent data from the Scott and Elmer wells, and by recent data from Continental Oil Company's Franklin 1, at Carpenteria. Also, the California Ventura Oil Company's No. 13, drilled on the fault trace, definitely off the Monterey anticline, and undoubtedly producing from the Pico, is the best well on the property. This well was completed in 1916, from a depth of 1250 feet, flowing at the rate of 100 barrels per day, and now, after 13 years, is still producing six barrels of oil per day. The deep test well has been located 1600 feet southwest of No. 13. Production is anticipated from an accumulation in the upturned Pico beds, trapped by the overlying, impervious, Monterey shales. Since this will be a test for production from the Ventura Avenue, Pico, sediments; beneath the overthrust, it is an important test.

Eighth Well at Elwood Flows 5500 Barrels

Santa Barbara, Calif.—Continuing their success in the Elwood field with uncanny precision, Barnsdall Oil Company and Rio Grande Oil Company have completed their eighth well, Luton-Bell 6, with an initial production of 5500 barrels. The well came in with the ease which has characterized former completions and was finished at 3470 feet. The oil was 39 gravity and showed a negligible cut. About 250 feet of sand was included, giving the well a thicker zone than earlier completions. Gas production was about two million cubic feet. Luton-Bell 6 is 500 feet from the nearest producer and only slightly extends the limits of the field. The new well, following closely after the completion of Doty 3, brings field production above 30,000 barrels from eight wells.

Outpost wells have met with little success and apparently are outside the producing limits of the main zone. There is a possibility of still deeper production, however. Petroleum Securities Company is drilling below 5300 feet in Storke 1, while J. E. O'Donnell has suspended operations at 5500 feet in Campbell 1.

Elwood Consolidated Oil Company, drilling in the Goleta area, is ready for a production test in Rekar 1, now standing cemented at 3310 feet. This well is located on a separate structure, but is only a few miles from the Elwood field.

Rincon

Ventura, Calif.—Richfield Oil Company is coring ahead at 7300 feet in Hobson Fee 1, now the only active deep test in the Rincon field. The formation is running to oil sand and shale and is beginning to show some promise. It is believed that the zones producing in the Ventura field have not been reached at Rincon.

Standard Oil Company's No. 3, after a suspension of several months, recently blew out from around the casing at 3000 feet. The accumulated pressure in the upper zone was much higher than was expected.

The number of drilling wells has fallen to eight, with two active locations. Production is holding around 3500 barrels from 25 wells.

General Petroleum Corporation has plugged back from 6650 feet to 4500 feet in Hobson A-3, preparatory to a production test. The company is underreaming at 3400 feet to cement casing at 4470 feet.

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Oklahoma--Kansas Field Notes

WARREN BAKER, *Staff Representative, Tulsa, Oklahoma*

Seminole Makes Unexpected Showing On Proration Test

TULSA.—For the second time the the open flow of the Greater Seminole district for potential purposes exceeded expectations. The third 24-hour open flow since the inauguration of the new proration program, covering the period from March 15 to April 1, showed 480,522 barrels. This is but slightly better than 3000 barrels below the figure produced two weeks ago under similar conditions. The output was expected to be smaller, due to a decline at Mission and Maud and lack of any important completions.

A surprising feature of the open flow test was the fact that Seminole City, Earlsboro, Bowlegs and Searight fields, all in the more settled and defined class, showed increase in production over the gauge for the previous 24-hour test.

The open flow gauge was taken during the 24 hours ending 7 a. m., March 17. The following 24 hours covered Sunday and the recovery of Greater Seminole showed a loss of 172,000 barrels, when it produced only 308,086 barrels. Despite this drop in production, the Sunday shut down was not as successful as it was on the previous Sunday, when recovery was brought down to 274,499 barrels. The open flow the previous 24 hours, made it hard to work the Sunday plan successfully, and much of the decline was due to the regular proration.

Production of Greater Seminole over a three day period covering all the different types of conditions for producing was as follows:

	Mar 16[1]	Mar 17[2]	Mar 18[3]
Little River	75,988	97,947	73,458
Maud	31,805	39,351	27,764
Mission	29,907	38,874	30,453
Bowlegs	34,882	46,273	26,019
Earlsboro	60,467	73,912	43,428
Seminole City	32,101	44,050	24,112
Searight	10,271	12,666	8,922
St. Louis	98,793	127,449	73,930
Totals	374,214	480,522	308,086

[1]Production prorated.

[2]Open for potential gauge.

[3]Many wells off production due to Sunday shut-down.

Evidently Mission is definitely on the decline. The field showed an open flow of 38,874 barrels this time, against 44,613 barrels two weeks ago. Maud showed a slight gain, but it has added a few wells. Outside of Mission, the largest drop in potential was at Little River.

7-7 Area Revived

Featuring Seminole development was the finding of a good producing well in the old 7-7 area, east of Little River. This area, scene of many disappointments, since completion of the discovery well, may see an increased exploration in the south end as a result of the new well, which is Mid-Continent Petroleum Corporation's Smith 3, SWc NW NE Section 5-7-7, south of the discovery well. It flowed 2770 barrels in 24 hours from the Wilcox sand at 4392-4401 feet.

An interesting completion in the Maud field was Amerada Petroleum Corporation's Hallum 4, SE NE SE Section 1-8-4, extreme northwest edge of the field. This well flowed 4820 barrels the first 24 hours from the Misener sand found at 4014-34 feet. There are a number of small wells between it and the main part of the field.

Gypsy Oil Company's Hartman 1, NE NW NE Section 12-8-4, west extension location at Maud, has a total depth of 4630 feet, where it is shutdown with a hole full of water. It probably will be abandoned.

In the Wilcox sand producing area at Maud, the north producing boundary apparently was found when Sinclair Oil and Gas Company's Bean 2, SWc NE NW Section 11-8-5, found a hole full of water from the Wilcox sand at 4354-58 feet. It is one-quarter of a mile ahead of production.

Oklahoma City Wells To Test All Pay Levels Found

The decline in production of the Indian Territory Illuminating Oil Company and Foster Petroleum Company's Fee 1, C SE SE Section 24-11-3w, discovery well and only producer in the Oklahoma field, has resulted in operators determining to test all of the upper pay levels encountered. Five tests are setting pipe after drilling and coring oil sands. Upon their outcome will depend much of the future importance of the field. If the shallower sands yield enough production to pay the expenses of drilling the wells, the testing of the sands would be a good investment from the operators standpoint.

Mid-Kansas Oil & Gas Company's Fortson 1, C SW NE Section 24-11-3w, has set the casing and is ready to bail. It will be the first of the wells to test.

The decline in the production of the discovery well was halted during the past week. After trying for more than three weeks on various methods of rebuilding the production, without success, the tubing was raised with the result that the output of the well increased to 2577 barrels from 2092 barrels. It was still making about one-half of one per cent. sediment, after treating. Gravity was 35.7, corrected, at a temperature of 68 degrees.

Coal County Wildcat is Deep Test

Tulsa.—Indian Territory Illuminating Oil Company's Cook 1-A, SE SW NW Section 10-1n-11e, rank wildcat of Coal County, Oklahoma, is drilling at 6700 feet, and is the second deepest test ever drilled in the state.

W. E. McGraw is moving in for a test in SW NE 11-1n-8e. He has just completed a test in Section 12-1s-8e, which found water in the Wilcox sand.

E. W. Whitney's Patton 1, SE SW NE Section 35-1n-8e, has plugged back to the Wapanucka lime at 2860 feet, where it is thought to be good for 15 barrels of 48.7 gravity oil.

Seminole County

Tulsa.—Sinclair Oil & Gas Company's Thompson 1, NE SW Section 18-9-7, east of the Seminole City pool, Seminole County, Oklahoma, has been drilled to 4257 feet in the Wilcox sand. It flowed 100 barrels from the Hunton lime and swabbed 167 barrels from the Wilcox sand in 14 hours.

Prairie Company Buys Slick's Producing Properties

INDEPENDENCE, Kansas.—Oil properties of T. B. Slick have been bought by the Prairie Oil & Gas Company. Only the routine of checking titles remains before closing the transaction.

The deal involves all the production of T. B. Slick, amounting to between 30,000 and 35,000 barrels daily, all oil in storage, all tankage, all lease equipment and a one-half interest in Slick's undeveloped acreage.

Slick is retaining ownership of his oil royalties. He is known to be one of the most extensive holders of oil royalty in the Mid-Continent. The consideration involved has not been announced.

The deal is certainly one of the most outstanding ever transacted in the Mid-Continent area. The petroleum industry has witnessed many transactions involving property of greater value, but it is doubtful if the petroleum industry ever before has witnessed an individual's selling properties of the value of these being relinquished by Slick. His holdings have been estimated as being worth from 30 to 50 million dollars.

Prairie Ranks Among World's Majors

By this transaction the Prairie Oil & Gas Company becomes one of the major oil producers of the world. Previous to acquisition of the Slick properties, Prairie Oil & Gas Company production in Kansas, Oklahoma and Texas was 70,000 barrels daily. The Slick production will place it above the 100,000-barrel class. In addition to this total, it has 10,000 barrels daily production through subsidiaries.

Production of the Slick deal is all sweet oil, the bulk of it being in the Seminole area of Oklahoma. Practically all production now owned by the Prairie comes under the sweet oil class. West Texas and Texas Panhandle wells of the Prairie produce about 8000 barrels of sour oil daily.

Indications are that the Slick properties will pass under the Prairie Oil & Gas Company banner and become absorbed in present Prairie properties. The Slick acreage is being checked against existing districts of the Prairie organization. With consummation of the deal, the Slick leases will come under the management of present Prairie officials and executives.

Disposition of Oil

What disposition will be made of oil from the Slick properties has not been determined. At present most of the Slick production is going to carriers other than the Prairie Pipe Line Company. Since the Slick properties are chiefly in Oklahoma, where Prairie Pipe Line facilities are greatest, the opportunity is good for the Prairie producing wing to turn over the oil to its transportation division.

Wildcat holdings of the transaction may reach a half million acres. While Slick has given personal attention to the development of his Seminole properties, he has found time to buy extensive wildcat acreage in Kansas, Oklahoma and Texas. The Prairie Oil & Gas Company will become owner of an undivided half of this wildcat acreage and it is understood, although not made public, that the purchaser will have charge of any drilling on this wildcat acreage.

Slick will take a rest for perhaps a year and then return to the oil fields. He contemplates a trip to Europe.

Career of T. B. Slick

He is perhaps the most colorful figure of the petroleum industry. His vast holdings have been acquired and developed personally. The personnel of his organization was scant, compared with the forces set up by other individuals and concerns with similar holdings. To a large extent he bought the leases in person, giving little heed to geology. During the rush of the Seminole development, Mr. Slick spent many nights around the rigs on his leases. He witnessed the completion of most of his wells.

This deal is his second oil success in a big way. He was a partner in the first well at Cushing. The property developed there later was sold and Slick enjoyed a brief vacation from oil by going to Europe.

On returning he became interested in railroad building. These ventures, however, did not match his successes in oil, so he returned to that field.

After ordinary success in Texas, he came again into big production by drilling into the Wilcox sand at Tonkawa. From then until now his place as an independent oil producer has mounted steadily.

Slick May Retire

There are those who believe Slick has decided to leave the petroleum industry and other business permanently. His Tulsa street railway property is under option and will likely be sold. The sale of his oil properties, indicated sale of one of his transportation units and the fact that recently he has talked of getting away from business leads some to believe he will not again strive for oil production as he has in the past.

Absence of Slick will be noticed at future meetings to consider methods of curtailing Oklahoma oil production. Although an avowed adherent to conservation, he has opposed several plans of the past two years with success. At the St. Louis pool, he declined to halt drilling or production, contending that the plan would allow other producers to gain time. When the Sunday shutdown came along, he was one of the first to adopt it and was perhaps the first to suggest it. He offered several other methods of curtailment but those never met with favor. Slick properties will pass into the hands of a company, which has favored curtailment constantly. Prairie Oil & Gas Company was the first of the major companies to adhere to the Sunday shutdown plan in Oklahoma. It is following this method at both Seminole and at Burbank.

Valley Center Potential Drops With Weeks Showing

TULSA. — Disappointing results were the lot of several new completions in Valley Center field of Sedgwick County, Kansas, during the past week. Potential production of the region may not be as large as many are inclined to believe it might be. At any rate the structure is quite erratic, and apparently the water problem will be a serious one.

The test of Kirk & Jones on the Brown tract in the NWc of Section 6-26-1e, filled up with sulphur water from the Simpson sand at 3412-15 feet. It is drilling ahead. This failure is in the district considered as proven productive. It is about three-eighth of a mile southeast of the Aladdin et al's Smyser 1 producer, which is the northermost well.

Alladin et al's well is making 375 barrels of crude daily, cutting 31 per cent. The outcome of the Patton et al townsite test, which will be the first of the wells to reach the sand in the Valley Center townsite, will tell if this is the north boundary of the field, or if the structure is so erratic that each test may be equivalent to a wildcat hole.

Another disappointing discovery of the week was the Skelly Oil-Davis and Hazlett's Wilson 3, NEc SE NE NE Section 1-26-1w, slightly southwest of the Kirk and Jones failure. This well swabbed 500 barrels of oil and 20 barrels of water the first 24 hours from 3416 feet. The water is coming from the bottom of the hole, and increasing.

The field was extended slightly east by the Bu-Vi-Bar Petroleum Company, Marland Production Company, Gypsy Oil Corporation's Thad Goodrich 2, SEc NE SW Section 6-26-1e, which made three bailers of water at 3387 feet, and after plugging back to 3583 feet did 28 barrels of oil on the swab. No. 1, same lease, one location south, did 307 barrels of oil on the pump in 10½ hours, with no water, earlier in the week.

Wilcox Oil & Gas Company and Amerada Petroleum Corporation's Teansil 1, C NW SW Section 32-25-19w, rank wildcat of western Kansas, in Barton County, had a rainbow show of oil at 4590-97 feet, but is drilling ahead at 4650 feet.

North and West Texas Field Notes

H. H. KING, *Staff Representative, Fort Worth, Texas*

Rapid Water Encroachment Causes Howard-Glasscock Concern

BIG SPRING, Texas.—Rapid water encroachment in the deep lime oil producing horizon in the Roberts-Settles field, Howard-Glasscock County, has taken place in the face of proration restrictions carried out in the field since its beginning.

A special committee of engineers assigned to study the water problem early in February has recommended that measures favoring a more gradual withdrawal of the oil by the pumping wells be applied. This committee recently submitted a report on the water situation to the Texas Railroad Commission along with recommendations. The latter body has called a hearing of all affected lease owners to be held in Dallas, March 19, as a preliminary step toward alteration of proration rules.

The water committee consists of the following: W. P. Laughter, deputy oil and gas supervisor, chairman; H. B. Hill, manager Dallas office of the United States Bureau of Mines; H. C. Hardison, The California Company; W. W. Warner, Amerada Petroleum Corporation; H. A. Holstein, Cosden & Company; and A. G. Evans-Lombe, Superior Oil Producing Company.

Deep pay areas in Howard-Glasscock County are found at the 3000, 2500 and 2200-foot levels, with the latter existing only in the Henshaw-Settles, or west extension of the field. Proration rules have been enforced throughout the producing life of all of these deep producers, except for Magnolia Petroleum Company's Dora Roberts 1, which discovered the 3000-foot pay and produced about 250,000 barrels of oil before a voluntary shut-in policy was applied to the field in February, 1928. The old and new wells were kept off production as completed until August 25, 1928, which was the starting date of proration. These deep sands had contributed a total of 4,144,056 barrels of oil between August 25, 1928 and February 16, 1929, although a large percentage of this total came from pumping wells. The 3000-foot pay is the most prolific in oil, and likewise the hardest hit by water encroachment. This horizon has 62 completed wells, which have proven up an area of approximately 2500 acres, or an average of about 40 acres to each producer. Limiting one producer to each 40-acre unit is one of the proration rules set up by the commission, although a few exceptions have been necessary to take care of direct offsets.

Bottom Hole Water

Bottom hole sulphur water has found its way into about 50 of these deep producers, although all are on the pump and equipped with tubing not exceeding three-inches in diameter. The practice of swabbing new wells upon completion to establish their first potential daily flow for proration purposes was abandoned more than a month ago by unanimous vote of the operators, owing to this swabbing test's pulling water into wells at the start. Potential production figures are determined by a one-hour pumping test supervised by Umpire E. E. Andrews, or a qualified assistant.

The committee of engineers appointed to make a study of water conditions in the 3000-foot horizon and recommend preventative measures included the following in their report:

"A particularly rapid encroachment of water occured in the Roberts-Settles pool 3000-foot pay soon after production started in the field. The order and quickness with which water appeared in scattered wells indicated an extremely rapid water encroachment up-dip without regard to the structure contours. Apparently the flowing pressure is due mostly to the hydrostatic pressure originally occurring around the edge of the field. The gas-oil ratio is low, and a relatively small volume of gas is produced with the oil.

"Initial fluid level of oil (average of 2200 feet in four wells), suggests a rock pressure of around 850 pounds per square inch. This relatively high fluid level and apparently rapid flow of fluid toward the hole are factors favorable to high initial (pumping) production. The normal high fluid level in a well during the early production period maintained a high back pressure on the pay formation, thus retarding the encroachment of water, or in other words the oil could have entered the hole when first drilled faster than the pumping equipment could have handled it. As the drainage area near the well was depleted it gradually became possible to handle all the fluid coming into the hole, and later to pump down the fluid close to the bottom, thus creating a differential of some 800 pounds per square inch. Accordingly, a condition existed in the more or less open and permeable lime very favorable to by-passing, or channeling of the water through the oil bank.

"The full section of the 3000-foot pay zone probably averages 45 feet, and probably consists of two members, as a number of wells have logged an impervious lime, or irregular thickness, separating the upper and lower pays. Due to the changing of conditions and irregularities in the saturation of the pay formation, possibly the best production occurs in a part of the zone of no great thickness. Because of the less open character of this formation, the drainage is considerably more rapid than in the tighter formation, consequently as soon as this part of the pay is partially, or completely depleted it forms a more or less natural channel for water encroachment. The water first reaches the well through the more porous and permeable parts of the pay, and rapid removal of the oil is favorable to and encourages premature flooding via this portion of the lime, thus trapping and complicating recovery in the saturated, but tighter parts of the formation.

"A gradual rise of the water table, more nearly in accordance with structure contours, suggesting a somewhat regular displacement of oil with water, is desirable for obtaining the highest possible ultimate recovery because it indicates complete flooding of the pay zone. When channeling and by-passing occur, especially in lime formations, through the more permeable parts of the pay and the water reaches the well, it is not possible, in many cases, by pumping methods, after a period of time, to lower the fluid level of the water sufficiently to recover the oil occurring in the tighter areas. Studied control of water conditions, methods, and uniform practices for taking advantage of the natural water drive are recommended. Maintenance of a high fluid level, together with slow and continuous pumping practices in wells producing clean oil ahead of the encroaching water, will probably retard the water encroachment into the well and will result in a better oil recovery, and it is the opinion of the committee that measures favoring this gradual withdrawal should be encouraged and continued."

Bureau of Mines Report

In addition to taking part in the compilation of the above water report, which

was recently submitted to members of the Texas Railroad Commission, the United States Bureau of Mines is to publish a detailed report, along with maps, charts, logs, etc., on the Roberts-Settles deep pay area. H. B. Hill, manager of the Dallas branch of the bureau, and C. B. Carpenter, assistant engineer, are now engaged in putting the finishing touches on their report, which will be forwarded to Washington for publication.

According to E. E. Andrews, umpire in charge of proration enforcement in the Howard-Glasscock County field, the potential production of 90 wells on production in the 3000, 2500 and 2200-foot horizons on March 15 amounted to about 72,000 barrels daily, based on one-hour pumping gauges. Production is limited to 35,000 barrels daily from the two lower horizons, and 10,000 barrels daily for the 16 wells in the 2200-foot horizon, making a total of 45,000 barrels daily. On this basis the operators will be allowed to pump their wells on an average of about 62½ per cent. of their estimated potential during the next proration period, ending April 16, 1929.

Two New Winkler Lines Ready April 1

San Angelo, Texas.—Separate trunk line extensions being layed by Gulf Pipe Line Company and the Magnolia Pipe Line Company from their Midland stations to tank farms in Winkler County will be completed about April 1, according to present schedules. These direct pipe line outlets for the Winkler County fields will not be operated at capacity for some months, as both Gulf Pipe Line Company and Magnolia Pipe Line Company are operating their lines out of Midland toward the Gulf Coast at near capacity.

Gulf Pipe Line Company is laying 10-inch welded pipe from Midland to a point near Monahans, Ward County, a distance of about 60 miles, and the remaining 18 miles of line required to reach its tank farm and pump station on the west side of Hendrick field will consist of eight-inch threaded pipe. About 52 miles of the Midland-Monahans unit had been welded at the close of last week, and gangs will be put to work connecting up the eight-inch pipe upon completion of the first unit. Less than a week will be required to complete the smaller line. Gulf Pipe Line Company is setting up a small field station, equipped with four 40-horsepower electric motors, to pump Winkler County oil into Midland tanks.

Magnolia Pipe Line Company is taking a direct route with its line from Midland tank farm and station to its Halley tank farm on the southeast side of Hendrick field, requiring about 63 miles of 10-inch welded pipe. Only one station will be used on this unit, and it will be equipped with motor driven reciprocating pumps. Magnolia's welding crews had finished more than 20 miles of the line at the close of last week.

Humble Extending Pipe Line Into New Mexico

SAN ANGELO, Texas.—Extension of the Humble Pipe Line Company's West Texas trunk line system into Lea County, New Mexico, is underway through the construction of 10 miles of eight-inch line from its gathering station in the Daugherty pool, Winkler County, to the Skelly Oil Company's wildcat oil producer near Jal, New Mexico.

Skelly Oil Company's Joiner 1, located in Section 26-25s-36e, was completed early last February, rated at 1000 barrels daily at 3331 feet, but is hunting for a connection.

The Texas Pipe Line Company is the first major carrier to announce a pipe line extension from Winkler County into southeastern New Mexico, having purchased about 25 miles of 10-inch line, but actual construction has been retarded.

These large lines are being built despite the fact Lea County's potential daily oil production from its scattered wells barely reaches the 2000-barrel mark.

Winkler Wells Decline

Bi-monthly potential production figures on Winkler County wells issued March 16 by Umpire R. A. Alsobrook credit the 555 producers with an estimated daily output of 2,378,019 barrels, representing a decline of 34,428 barrels below the figure released on the first of the month, although 15 new completions were registered during the 15-day interval and only a small percentage of the total wells were re-gauged. Allowance for the county is 175,000 barrels daily.

O'Brien pool, south Winkler County, added another failure during the past week when Independent Oil & Gas Company's Morton-Russell 1 was ordered plugged with hole full of sulphur water at 3165 feet. This test is on a line between four small producers in the pool and the Hendrick field, thereby lessening the prospects of the two areas being joined. Simms Oil Company and Southwest Oil Production Company's Sealy 1, which recently extended the pool nearly a half mile to the south although offset to the east by a failure, went dead March 11 after flowing a small volume of fluid by agitating sand at 2870-2994 feet. Plans are to deepen this well in search of a lower break in the lime pay, and abandon same unless production is increased.

Estimated potential daily production in the Yates field on March 15 was rated at 4,762,705 barrels from 300 producers, according to Umpire Ray Richmond, and the proration allowance during the remainder of the month is to be 87,500 barrels daily. Five new producers were added during the past two weeks, and only one old well was re-tested for potential flow. The fluid has only seven active tests underway.

Shallow Tests for Mitchell County

From six to 10 shallow tests are planned for southwestern Mitchell County on the strength of favorable geological reports and the recent discovery of a strong flow of shallow gas by Simms Oil Company's wildcat test on the I. L. Ellwood ranch at center of southeast quarter of Section 29, Block 18, S. P. Ry. Survey. This wildcat made in excess of six million cubic feet of dry gas at 600 feet, and the sand has been cased off to try for shallow production, while in the meantime a northeast offset has been started by Simms to make a shallow gasser. A ready market is available for natural gas in this general area, with Big Spring furnishing the principal demand. Simms Oil Company has obtained lease on all of Section 32 and the east half of Section 33 from the Ellwood interests, same being slightly more than two miles southeast of the above activity, and will start a 2000-foot test shortly. The Westyde Investment Company is starting a test on the same ranch in Section 38, Block 16, while Republic Production Company will drill on the Scott ranch to the west of Simms' gas strike. Gibson-Johnson et al are contemplating a group of shallow wildcats in this same area, while the McGinley-Sigler Interests are reported to have contracted to drill on the Scott ranch also.

South Pampa Completion Unusually Large

Amarillo, Texas.—An inside location in the South Pampa field, Gray County, contributed an unusually large completion during the past week when the Operators Oil Company's W. Jackson 3 gauged 100 barrels of oil per hour for six hours, with an estimated flow of 15 million cubic feet of gas from regular pay in the granite wash formation at 2840-45 feet. This well is located on the north line of the company's 80-acre lease, which consists of the north half of the NE¼ Section 88, Blk. B-2, H.&G.N. Survey. The original location was staked in April, 1928, but drilling was postponed until January.

Preparations are being made by Big Bend Oil Company to plug back its deep wildcat test on the Mrs. Ledrick et al ranch, Roberts County, after drilling to a total depth of 5975 feet, with three-inch casing set at 5155 feet and two-inch liner at 5710 feet. This wildcat was spudded in June, 1924, by Phil Engle and associates, and is the oldest listing on the Panhandle drilling report. Numerous small showings of high gravity oil and some gas were encountered in making this record depth for the district, while the smallness of the hole used below the mile depth is a credit to the crew.

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Gulf Coast Field Developments

JACK LOGAN, *Staff Representative, Houston, Texas*

Washington County Well Completed in 9 Days

Brenham, Texas.—Completion of a 1000-barrel flowing well within nine days from the spudding date was accomplished in Sun Oil Company's Geo. F. Grote 6, an inside location on the Clay Creek dome, Washington County. This test was spudded March 2, and time was lost in cementing the usual surface pipe and also a string of 6⅝-inch casing above the oil sand at 908 feet.

The pay was logged at 925-1225 feet, and on March 11 the well was placed in the completion class as a 1000-barrel producer.

Rotaries are used in Clay Creek dome drilling, and formations are soft enough to make the entire hole in one day, except that most of the hole below the 500-foot level is cored for geological information.

Sun Oil Company controls the acreage around this dome, and six completions flowed 3955 barrels March 15, with back pressure being applied on some of the wells, while Grote 2, which was the first big well scored in the field, remained off production because of plugging back from bottom hole water.

Hackberry Most Active South Louisiana Area

Houston.—During the past week three new wells were completed on the south flank of the old Hackberry dome, Cameron Parish, Louisiana, making a total of six producing wells that have been finished on that old dome, all within the past few months.

Moon Oil Company (Seiss, Green & Sutton), brought in Sanner 2 for 900 barrels of pipe line oil testing 23.5 gravity, the production being from 15 feet of sand at 3128 feet. This well is 142 feet due north of Seiss, Green & Sutton's Sanner 1, which came in about one month ago for 800 barrels at 3158 feet. These wells are the most easterly producers on the dome, and the most northerly of the group on the south flank of the field.

Federal Petroleum Company, which has headquarters in Lake Charles, Louisiana, and in Houston, and which is owned by the same interests as the Republic Production Company, completed two producers during the week, extending the productive area slightly to the south of the discovery well at Hackberry, Cameron Oil Company-Rycade Oil Corporation's Duhon 2. Federal Petroleum Company's Kaough 1 is now the most southerly producer of the dome. It came in flowing by heads, making an estimated 800 barrels pipe line oil, with the bottom at 3215 feet. Federal Petroleum Company's Kaough 2, located 118 feet due north of Kaough 1, is reported to have come in for 1500 barrels initial, with the bottom of the hole at 3280 feet.

Cameron Oil Company and Rycade Oil Corporation's Duhon 2, the first commercial producer at Hackberry, was completed about December 1, 1928, flowing around 250 barrels daily at 3151 feet.

Aside from the above named wells, one other test at Hackberry has found oil in commercial quantity, apparently. That is Rycade Oil Corporation's Gulf Land 1, located on the west flank of the dome, approximately 4000 varas northwest of the discovery well of the field. It will be put on the beam, and is expected to make a 50-barrel pumper.

Cameron Oil Company and Rycade Oil Corporation also expect to make a pumper of Duhon 3, which offsets the discovery well 150 feet to the north.

Hackberry is now the most active area in South Louisiana, with approximately 20 rigs running.

Salt Flat Production Extends Six Miles

Houston.—Capps et al's New 1, north extension test at Salt Flat, Caldwell County, has been completed for 200 barrels production daily, swabbing. Its depth is 2750 feet. With this well producing, the field is now over six miles long.

Cranfill & Reynolds' Northcutt 1, also in the north end of the field, beside being west of other production, pumped 236 barrels in 16 hours, according to a recent report.

During the week ending March 17 there were 16 new locations made at Salt Flat; and during that period the average daily production of the field was 31,050 barrels, according to American Petroleum Institute estimates.

Progress on the two new pipe lines out of Salt Flat, those of the Humble Pipe Line Company and of Shell Pipe Line Company, was considerably delayed by heavy rains last week, but work has been started on both lines.

Humble Pipe Line Company's line will be eight-inch, and will lead south to West Columbia, a distance of 128 miles. Shell Pipe Line Company will connect with the trunk line now under construction from West Texas to the Houston Ship Channel, the connection to be made near Austin, around 37 miles from Salt Flat.

Humble Well Still Flows 200 Barrels

Houston. — South Texas Petroleum Company's Morris 3 at Humble, was still flowing around 200 barrels daily on Tuesday of this week without screen set in pay sand. It is making 42 gravity oil from a total depth of 4831 feet. Casing is set at 4110 feet.

Last Thursday night the well blew in before screen could be set, and subsequently an attempt to set screen was unsuccessful, the screen being blown up, probably into the casing.

This test, a southwest offset to No. 1 of the same owners, South Texas Petroleum Company (Cullen & West). Morris 1 came in January 4 for around 2500 barrels initial production from 5347 feet, the oil testing around 44 degrees gravity. That well is still flowing approximately 1300 barrels daily.

The Texas Company is drilling an offset to the above producer, Stevenson 39, which early this week was drilling hard shale at 4125 feet.

Port Barre Dome

Houston.—The Texas Company has tested salt water in Botney Bay Fee 1, located on the Port Barre dome, St. Landry Parish, Louisiana, and is preparing to drill deeper.

This test came in about February 15, 1929, showing 7,000,000 feet of gas and making 800 barrels daily of 23.4 corrected gravity pipe line oil through a three-eighths-inch choke. But screen was not set, and the well soon afterward quit flowing. Screen was later set but the well failed to come back, and then in swabbing the swab was lost and had to be fished out. The well had been deepened several feet from its original depth when the test was made last week; that original depth was 3766 feet.

This test of The Texas Company is 8100 feet south and 3200 feet west of the northeast corner of T-6-s, R-5-e. The dome on which it is located was discovered and outlined through geophysical work. Gulf Refining Company of Louisiana and The Texas Company are the principal operators holding leases in the area.

Bayou Bouillon

Houston.—Rycade Oil Corporation's Bayou Bouillon Fee 6 at Bayou Bouillon, St. Martin Parish, Louisiana, was drilling the plug Tuesday of this week, casing having been set over an oil sand with the bottom of the hole at 3122 feet.

Rycade Oil Corporation has abandoned Atchafalaya Fee 3 in that field at 5165 feet in salt. That test is 300 feet north of Atchafalaya Fee 2, Bayou Bouillon discovery well, which was completed in March, 1928.

Rycade Oil Corporation is the only concern operating at Bayou Bouillon. It has five rigs running there.

Additional Gas Line to Serve San Antonio

Houston.—At an estimated cost of $2,750,000 the Houston Gulf Gas Company, a subsidiary of the United Gas Company (Moody-Seagraves interests) will lay a 16-inch natural gas line from the Refugio field, Refugio County, to a point 22 miles east of San Antonio. Length of the line will be 106 miles. Survey has been completed and work of laying the line will begin at once. Engineering will be done by the United Gas Engineering Corporation, another subsidiary of the United Gas Company.

Along the line are the following towns which will be supplied with gas: Karnes City, Kennedy, Floresville, Poth, Falls City, Sashamco and Elmendorf. Connecting with the main line in Karnes City will be a lateral running east to Yorktown, supplying Runge, Nordheim and Yorktown.

Distribution of the gas from this line will be through the Southwest Distributing Company, a newly organized subsidiary of the United Gas Company.

Lost Lake

Houston.—Pure Oil Company's Mayes 1 at Lost Lake, Chambers County, in which an oil and gas sand at 2067 feet was tested, now has a fishing job, following a gas blowout. After the plug was drilled and the well washed, the well began making a large amount of gas and blew the liner upward, and preparations were being made Tuesday to fish for the liner. Considerable wash water was displaced, but the well did not make much oil. This is a new sand, higher up than those at Lost Lake which in the past have had important showings. Mayes 1 is 1600 feet west of Pure Oil Company's Lost River 1, which made some oil, but not in commercial quantity, at 3670 feet. The Mayes test is closer in to the dome than Lost River 1. The latter was finally abandoned in cap rock at 4700 feet after having topped the cap at 3950 feet.

During the past week Pure Oil Company abandoned Lost Lake 2 at Lost Lake dome, finishing it in anhydrite at 4192 feet, after having topped the cap rock at 3943 feet. Lost Lake 2 is nearly one mile south of Mayes 1, and is 1500 feet from the nearest test, Lost Lake 1, which was abandoned in cap rock at 3635 feet.

Allen Dome

Houston.—Production at Allen Dome, Brazoria County, was around 175 barrels per day at the opening of this week; with two wells producing. Shell Petroleum Corporation's Allen 4, which had been worked over, was flowing 165 barrels net oil, and the same company's Allen Bernard 1 was pumping 10 barrels. The Shell Petroleum Corporation's only other activity at Allen dome is Reese 3, which has drilled into salt and is being abandoned.

Gonzales County Tests at Critical Stage

Houston.—In the Ottine area between Luling and Gonzales in Gonzales County, where the Empire Gas & Fuel Company completed a producing well shortly before Christmas, two tests are at interesting levels.

The first test that the Empire Gas & Fuel Company has started following completion of the discovery well, Norwood 1, is State 1 in the San Marcos River bed. This test is credited with having encountered the Edwards lime at 4057 feet, and with having encountered a show of sulphur water at 4077 feet. Top of the Austin chalk in this test is at 3600 feet, and top of the Buda lime at 3884 feet.

Indiana Petroleum Corporation's Karnstadt 1, located one-fourth mile southwest of Empire Gas & Fuel Company's Norwood 1, was reported early this week to be in the Taylor marl at 4025 feet, after having topped Austin chalk at 3885 feet.

The discovery well on the area, Norwood 1, is pumping around 125 barrels net oil, together with 10 per cent. water from the base of the Taylor marl at 3779 feet.

Cranfill & Reynolds' Webb 1, the first offset that was completed, located 480 feet south of the discovery well, was abandoned at 4281 feet in the Edwards lime, which it had topped at 4260 feet. This test topped the Austin chalk at 3802 feet, while the discovery well topped it at 3770 feet.

The fact that Empire Gas & Fuel Company's present test, State 1, topped the chalk higher than any of the others of the area, finding it even higher than the discovery well, caused considerable interest.

Sunday Shut-Down Plan Extends to West Texas

San Angelo, Texas.—Application of the Sunday shutdown plan on producing wells in West Texas district is in prospect, with a group of lease owners in the Howard-Glasscock County field having already put the plan into effect on their pumping wells along with drilling tests.

Cosden & Company, Inc.; Magnolia Petroleum Company, Amerada-Rycade Oil Corporation, Humble Oil & Refining Company, and others have agreed to close down on production in this particular field on Sunday, except where offset lease owners fail to cooperate.

Indications are that the plan will be adopted in other fields in the district.

A trio of wildcat failures for Irion County were scored during the past week, including the Sun Oil Company's Tankersley 1, which has been ordered plugged at 1452 feet. Signal Oil Company's second try for shallow production on the Sugg ranch has suspended drilling at 1975 feet, with a hole full of sulphur water, while the Pecos Valley Oil Company's Joe Stock 1 is flowing sulphur water at 1020 feet, but drilling ahead at 1115 feet.

Phillips Petroleum Company's wildcat test on the Holman land, Sutton County, is the deepest drilling test, having reached a depth of 6065 feet.

Mission Drilling Company Moody-Seagraves Unit

Houston.—Properties of the Mission Drilling Company of Texas have been acquired by the Mission Drilling Company, a Delaware corporation which has just been formed as a subsidiary of United Gas Company, under Moody-Seagraves management.

Holdings involved in the transaction consist of 651 acres of proven leases in the Refugio field, Refugio County. That property at Refugio includes a 78-acre lease on the southeast flank of the field on which is located the Cummings 1, which is producing around 300 barrels daily from 3699 feet. During the 30 days after completion, that well produced 10,000 barrels net oil, with the flow pinched. The well is flowing through 8½-inch casing, and registering 400 pounds pressure. Like all the other oil wells at Refugio, it is making large percentage of water. Immediately above the horizon from which this oil is coming is a prolific gas stratum.

Mission Drilling Company will function not only as an oil and gas producing subsidiary of the United States Company, but will also drill wells under contract for other subsidiaries of that concern.

Officers of the Mission Drilling Company include: O. R. Seagraves, president; W. L. Moody, III, vice president and treasurer; George E. Smith, vice president and general manager. Directors are: O. R. Seagraves, W. L. Moody III, M. W. Hunter, George E. Smith and N. N. Oille.

Jasper County Producer Makes Pipe Line Oil

Houston.—Rockland shallow oil district last week got its first production of pipe line quality with completion of Mark Kleeden's No. 4, 2½ miles northeast of Rockland in the Jasper County panhandle, making the biggest production thus far had in this area.

Kleeden 4, the third well to produce in paying quantities in this vicinity, was reported good for between 100 and 150 barrels. It was flowing through 2½-inch tubing after completion by heads of 25 barrels every six hours. Apparently this well has more gas pressure than previously found in Rockland district wells. Former wells there have showed little "kick" and developed salt water before completion.

The new producer is located in the Britton-Addison Survey, near the northern bank of the Neches river. It has been offset by No. 5 at a location 300 feet northwest.

THE NATURAL GAS INDUSTRY

Distribution of Gas in California to Increase

Los Angeles.—Discoveries during the past year in California are expected to greatly increase the distribution and use of natural gas in the state. Lines are being built to serve cities which had formerly held little hope of securing an almost unlimited supply of gas for fuel.

Cities lying along the Pacific Coast have been insured a permanent supply from fields found during the past year, while Bay cities will be directly benefited by San Joaquin Valley discoveries. A large network of gas line will be built to serve dozens of large cities. The 22-inch line being built between Kettleman Hills and San Francisco Bay cities will be completed before next winter.

Shorter lines will be laid from the Carpenteria district if a large gas supply is developed.

Los Angeles Basin cities have more natural gas than they can use, daily wastage being enough to serve a city of 500,000 people. Short lines are being built for a wider distribution of the gas used.

Lone Star Increasing Gas Handling Facilities

Dallas. — Transportation facilities for marketing an additional 100 million cubic feet of natural gas daily from fields in Southern Oklahoma and the Texas Panhandle will be provided shortly by the Lone Star Gas Company, according to Frank L. Chase, vice-president and general manager.

The first unit in the expansion program provides for immediate construction of 135 miles of 20-inch welded line from the company's terminal at Petrolia, Texas, to Fort Worth and Dallas, running parallel to a 10- and a 16-inch line system in service, while another line is scheduled to be built from Petrolia station into Southern Oklahoma to parallel two 12-inch carriers that have been in service a number of years.

Steady growth in natural gas consumption in cities and towns in North and Central Texas served by the Lone Star Gas Company and its subsidiaries is boosting the demand to a new peak each winter.. The new lines will enable the company to continue to meet such demands.

The Petrolia station, which is located about 15 miles northeast of Wichita Falls, is the junction point for two lines extending south from Oklahoma and the 18-inch carrier extending from the Wheeler County, Panhandle district, gas area. The Wheeler County-Petrolia unit was completed in June, 1927, and consists of 185 miles of trunk line, but has never been operated at capacity because of inadequate transportation facilities from Petrolia to Fort Worth and Dallas. The new 20-inch unit will correct this situation, and provide a surplus capacity for the supplemental line proposed from Southern Oklahoma fields to Petrolia. Lone Star Gas Company has a 16-inch line from Petrolia to Fort Worth, and is using the government's 10-inch carrier between Petrolia and Fort Worth through a lease contract. The latter line was built by the government to deliver Helium bearing gas from the old Petrolia shallow field to Helium plant at Fort Worth, and Lone Star supplies the gas under a long time contract. However, the Fort Worth Helium plant was shut down and ordered abandoned several months ago.

Construction work on the new 20-inch carrier extending southeast from Petrolia will start about May 1, and the line will be completed and put into service before next winter. No decision has been made as to whether this construction work will be performed by company crews, or by pipe line contractors, but heretofore the latter have built most of Lone Star Gas Company's major pipe line projects.

Officers Named

Shreveport, La.—Little Rock Gas and Fuel Company, recently acquired by the Henry L. Doherty interests from the Dawes interests, has elected the following officers: Henry L. Doherty, New York, president; W. A. Jones, F. R. Coates, and L. F. Musil, all of New York, vice-presidents; D. W. Harris, vice-president and general manager of the Arkansas Natural Gas Corporation, Shreveport, vice-president; R. W. Curran, general manager; E. N. Watkins, Shreveport, secretary; L. E. Smith, Shreveport, assistant secretary; E. H. Johnson, New York, treasurer; and B. R. Muirhead, Shreveport, assistant treasurer.

The following were named on the board of directors: Henry L. Doherty, W. A. Jones, F. R. Coates, L. F. Musil, H. O. Caster, R. S. Sloan, all of New York; D. W. Harris and J. R. Munce, Shreveport; and R. W. Curran, of Little Rock.

Montana Line Extensions

Great Falls, Mont.—A pipe line project which may attain considerable proportions in Montana is one which proposes to extend several lines already in existence from Northern Montana, Southern Alberta, and Eastern Montana gas-producing fields across the state of North Dakota and Minnesota. The announced system, together with the lines already in use, will place the Montana gas supply at the very eastern border of Minnesota.

The line in use extends to Bowman, North Dakota and this will, according to plan, be laid to Fargo as soon as possible. Structures along the right-of-way of this line will be developed as the line progresses. Montana-Dakota Power Company is the concern which will control the project as now outlined.

Wyoming Gas Discovery

Casper, Wyo.—What appears another gas discovery in Wyoming is that recently developed on the Alkali Creek structure by Mountain Fuel Supply Company, operating the well originally started by the Prairie Oil & Gas Company. At 2480 feet, a "tremendous flow of gas" was encountered, and then the well was shut down.

It will be completed by Mountain Fuel Supply Company, a subsidiary of Ohio Oil Company organized for the purpose of developing natural gas for the Uintah Pipe Line Company's line, which is being laid from Southwestern Wyoming to Utah.

Alkali Creek is a wildcat structure in Southeastern Sweetwater County, a short distance east and north of Hiawatha dome.

Arkansas and Louisiana Properties Transferred

Shreveport, La.—Southern Cities Distributing Company, a subsidiary of the Doherty interests, has transferred to the Arkansas Fuel Oil Company all the equipment including leases, drilling equipment and pipe lines, used in the North Louisiana-South Arkansas territory. It is understood this company will have entire charge of the oil production for the Doherty interests in the two states.

The Arkansas Natural Gas Corporation, a Doherty subsidiary, recently transferred to the Arkansas-Louisiana Pipe Line Company all the gas line property in the two states.

New Gas Line to Serve Humble Plant at Ingleside

Corpus Christi, Texas—Moran Corporation of the South, which maintains headquarters temporarily in Shreveport, has recently completed a six-inch gas line from White Point gas field, San Patricio County, to Humble Oil & Refining Company's Ingleside refinery and is furnishing gas to the refinery for fuel.

This line completion represents the first part of an extensive line building program in this immediate territory by Moran Corporation, construction of which is in charge of John W. Anderson, vice president, and Thomas Lanigan, formerly with Hope Engineering Company. A distributing system for the towns of Portland, Gregory, Ingleside and Aransas Pass are nearing completion, and delivery of domestic fuel to these points is expected within the next few weeks.

Moran Corporation headquarters will be moved to Houston in April, according to a statement from Mr. Anderson last week.

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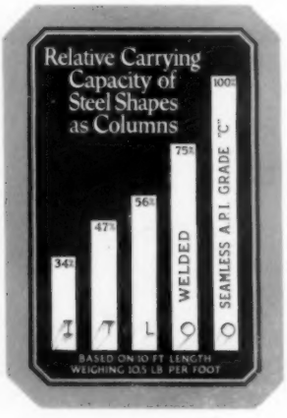

Chart showing the superior compressive load strength of the seamless steel pipe used for Champion Derrick leg sections.

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The seamless pipe legs will carry heavy over-loading. The structural members used for bracing, and the connection clamps have approximately equal strength values. Every part of the derrick approaches an equal efficiency in carrying its share of the load. This eliminates excess weight in any one part of the structure and prevents failure from subnormal strength of any member.

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Stocks in All Principal Fields

Tentative Program American Association of Petroleum Geologists, Fort Worth Meeting

March 21, 22 and 23

THURSDAY MORNING
March 21

CRYSTAL BALLROOM

1. Revision of Formation Contacts and Mapping of the Pennsylvanian in North-Central Texas.—F. B. Plummer.

2. The Texon Deep Well in Reagan County, Texas.—Dr. E. H. Sellards and Waldo Williams.

3. Recent Exploration for Oil in Michigan.—T. Wasson.

THURSDAY AFTERNOON
March 21

Stratigraphy

CRYSTAL BALLROOM

Symposium on the Stratigraphy of the Permian Basin of Southwestern United States.

A. W. McCoy, Chairman.

General Subject:

Correlation of the Pennsylvanian and Permian of the Delaware and Glass Mountains with the Pennsylvanian and Permian of the Great Salt Basin of Western Texas and Eastern New Mexico.

Special Papers:

1. Correlation and Identification of the Pennsylvanian and Permian of the Delaware Mountains and the Rustler Hills in Texas and New Mexico and their Eastern Extension.—W. Grant Blanchard, Jr. and Morgan Davis.

2. Correlation of the Pennsylvanian and Permian Between the Glass Mountains and the Delaware Mountains—I. A. Keyte.

3. Subsurface Correlation of Beds Encountered in Drilling in Lea County, New Mexico and Winkler County, Texas.—Dr. K. H. Crandall.

4. The Castile Formation Re-defined.—Lon A. Cartwright, Jr.

5. Stratigraphy of the Outcropping Carboniferous and Permian Rocks of Trans-Pecos, Texas.—Philip B. King and Robert E. King.

6. Stratigraphic Controls in the Texas Permian—Dr. Robin Willis.

THURSDAY AFTERNOON
March 21

Miscellaneous Papers

CACTUS ROOM

1. The Shale Gas Industry of Eastern Kansas.—Homer H. Charles and James E. Page.

2. Pre-Mississippian Sediment in Centra Kansas. (Read by title).—Fanny Carter Edson.

3. Pre-Pennsylvanian Stratigraphy of the Front Range in Colorado.—A. E. Brainard, H. L. Baldwin and I. A. Keyte.

4. Notes on the Pennsylvanian Section at Lost Lake, Colorado.—A. E. Brainard, H. L. Baldwin and I. A. Keyte.

5. Structural Features of the West Franklin Formation of Southwestern Indiana. (Read by title).—R. S. Shrock and C. A. Malott.

6. Role of Geologic Structure in the Accumulation of Petroleum. (Read by title).—F. G. Clapp.

7. Notes on the Oilfields and Structure of the Sweetgrass Arch, Montana. (Read by title).—T. B. Paine.

8. The Geology of the Larremore Field, Caldwell County, Texas. (Read by title).—A. W. Weeks.

9. Structural Geology and Stratigraphy of Southwest Oklahoma.—C. M. Becker.

10. Carbon Ratios and Oil Gravities in the Rocky Mountain Region.—C. E. Dobbin.

FRIDAY MORNING
March 22

Geophysical Papers

CACTUS ROOM

1. Tables of Terrave Corrections.—Dr. Donald C. Barton.

2. The Hotchkiss Superdip: A New Magnetometer.—Dr. Noel H. Stearn.

3. The Oil Well Decline Formula; Hyperbolic or Polynomial?—Dr. Roswell H. Johnson.

4. The Mercury Method for the Measurement of the Volume of Rock Specimens in Porosity Determinations.—W. B. Geoly.

5. Least Square Adjustment of Magnetometer and Torsion Balance Surveys.—Dr. Donald C. Barton.

6. Helium—Its Probable Origin and Concentration in the Amarillo Field.—Paul Rudeman and L. M. Oles.

FRIDAY MORNING
March 22

Stratigraphy

CRYSTAL BOLLROOM

Symposium on the Stratigraphy of the Permian Basin of Southwestern United States.

A. W. McCoy, Chairman.

General Subject:

Correlation of the Permian of Texas and Eastern New Mexico with the Permian of Oklahoma, Kansas, Wyoming and Utah.

Special Papers:

1. Correlation of the Pennsylvanian and Permian or Northern Arizona, Southern Utah, Southwestern Colorado, and Northern New Mexico.—Dr. J. B. Reeside and A. A. Baker.

2. Correlation of the Pennsylvanian from North-Central Texas to Central Oklahoma.—R. C. Moore.

3. The Triassic of West Texas.—J. E. Adams.

4. A correlation of Permian Outcrops on the Eastern Side of the West Texas Basin—A. M. Lloyd and W. C. Thompson.

5. The Capitan Limestone and Associated Formations.—E. Russell Lloyd.

FRIDAY AFTERNOON
March 22

Paleontological Section

CACTUS ROOM

Business Session.

Tertiary and Recent Faunas

1. Claiborne Subsurface Sections of Eastern Texas and Western Louisiana. Illustrated with Lantern Slides.—Alvin C. Ellisor.

2. A study in Variations in Recent Faunas Along the Gulf Coast of Texas and Louisiana as found in the Transition from Fresh to Marine Environments.—Marcus A. Hanna, W. G. Parker and Karl E. Young.

3. Cretaceous and Lower Tertiary Diatoms from Texas and Louisiana.—Marcus A. Hanna and G. Dallas Hanna.

Cretaceous Faunas

4. A Section in Penninsular Florida—G. R. and P. L. Applin.

5. Notes on the Del Rio and Buda Formations in West Texas.—Timothy W. Stanton.

6. Cretaceous Echinoids of the Genus Macraster.—W. S. Adkins.

7. Upper Cretaceous of Maverick County, Texas.—Karl E. Young.

8. Some Upper Cretaceous Foraminifera from near Coalinga, California. Illustrated with lantern slides.—Joseph A. Cushman and C. C. Church.

9. Notes on the Cretaceous of Lower California.—F. M. Anderson and G. Dallas Hanna.

Carboniferous Faunas

10. Faunal Relation of the Pennsylvanian at McCoy, Colorado.—I. A. Keyte.

11. Youngest Faunas of the Non-Red Permian of Southern Kansas and Northern Oklahoma. Illustrated with lantern slides.—Margaret Fuller Boos.

FRIDAY AFTERNOON
March 22

Structural Geology

CRYSTAL BOLLROOM

1. Tectonic Classification of Oil Fields in the United States.—Dr. Water A. Ver Wiebe.

(Discussed by Dr. Sidney Powers and W. B. Wilson).

2. Resume of Discoveries and Develop-

ments in West Texas in 1928.—Roger Dennison.

3. Tectonics of West Texas and Eastern New Mexico.—Ben C. Belt.

4. Resume of Discoveries and Developments in East Texas in 1928.—Sidney A. Judson.

5. Geology of East Texas with a discussion on Salt Movements and with Special Reference to Mt. Sylvan Salt Dome.—E. A. Wendlant and G. Moses Knebel.

6. Tectonics of Southern Oklahoma.—Dr. Sidney Powers.

7. En-Echelon Tension Fissures and Faults in Osage County, Oklahoma.—Dr. T. A. Link.

SATURDAY MORNING
March 23

CRYSTAL BALLROOM

1. The Environment of Pennsylvanian Life in North America. (Address of the President of the Society of Economic Paleontologists and Mineralogists.)—Dr. R. C. Moore.

2. Unconformities in the Upper Cretaceous Series of Texas.—Dr. L. W. Stephenson.

3. Stratigraphic Information Obtained from Drilling into the Lower Cretaceous in Southern Arkansas and Northern Louisiana.—W. C. Spooner, R. T. Hazzard and M. C. Israelsky.

4. Influence of Venezuelan Production on the Oil Market of the United States.—E. B. Hopkins.

5. Crooked holes in Oil Field Development.—Dr. F. H. Lahee.

SATURDAY MORNING
March 23

Paleonological Section

CRYSTAL BALLROOM AND CACTUS ROOM

12. Presidential Address: The Environment of Pennsylvanian Life in North America.—Raymond C. Moore.

General Subjects:

13. The Problem of Reworked Foraminifera and its Bearing on Correlation. Lantern Slides.—Joseph A. Cushman.

14. Fish Otoliths, Their Occurence and Value as Stratigraphic Markers.—Robert B. Campbell.

15. The Preparation of Illustrations of Fossils.—G. Dallas Hanna.

16. Material on the Use of Slides.—Helene Jeanne Plummer.

17. Galena and Sphalerite in the Fayette at Moore Dome, Fort Bend County, Texas.—Marcus A. Hanna.

18. Business Session and Election of officers.

SATURDAY AFTERNOON
March 23

CRYSTAL BALLROOM

1. The Cretaceous-Eocene Unconformity in Venezuela.—Wm. F. Jones and Dr. W. L. Whitehead.

2. The Monterey Group of Californian. (Read by title).—J. E. Eaton.

3. Undergraduate Preparation for the Geologist. (Read by title).—Dr. Ellis W. Shuler.

4. The Georgetown Formation of Central Texas and its North Texas Equivalents.—R. H. Cuyler.

Magnolia Pipe Line Runs Under January Average in February

DALLAS.—Magnolia Pipe Line Company's crude runs from Oklahoma, Texas, Louisiana, Arkansas and Kansas averaged 103,709 barrels daily during February, as compared to 110,091 barrels in January. These figures represent crude produced, purchased and royalty oil of the Magnolia Petroleum Company, but do not include the heavy volume of oil handled daily by this company from the above five states for other companies on a common carrier basis to the Gulf Coast. The loss of 6,382 barrels in daily average runs during February was about equally distributed over Oklahoma, Texas, Louisiana and Arkansas, and is due to natural decline in production and bad weather.

Heavy common carrier business being transacted by the Magnolia Petroleum Company is keeping its trunk line system, extending from the Mid-Continent and West Texas districts to Beaumont, loaded to capacity. For this reason, crude stocks were accumulated in Oklahoma again last month. Magnolia Petroleum Company added to Oklahoma stocks at average rate of 8,320 barrels daily during February, thereby boosting the total stocks on hand at the close of the month to 9,781,060 barrels, or a new record for the company on stocks in Oklahoma. The nearest approach to this storage record was made in November, 1924, when stocks climbed to 9,574,125 barrels, but increased trunk line capacity to the coast resulted in heavy withdrawals from storage for months afterwards, and the re-building of heavy stocks did not set in until the Greater Seminole district became a major oil source.

Market Position Well Balanced

This company's position in the crude market is better balanced than it was towards the close of 1928. The decline in crude runs for its own account has been accompanied by a period of heavier crude shipments via tankers from Baeumont terminals to Atlantic Coast refining points, especially to Standard Oil Company of New York, the parent organization.

During February, Magnolia Petroleum Company loaded 13 cargoes of crude, aggregating 838,226 barrels, as compared to 854,284 barrels in January and 745,592 barrels in December. The balancing of its crude supply with demand, or approach to such conditions, lessens the possibilities of the company taking the initiative in making crude price changes.

Tanker shipments of refined oils (gasoline, kerosene, naphtha, lubes, etc.) made by Magnolia Petroleum during February amounted to 51,738,890 gallons, as compared to 64,975,868 gallons in January, while water movement of fuel oil amounted to 5,376,559 gallons in February, or 645,986 gallons under the volume dispatched during January. This water movement is consigned to Atlantic and Gulf Coast points as well as foreign countries.

Total crude runs made by Magnolia Pipe Line Company, exclusive of common carrier business, from fields in Oklahoma, Texas, Louisiana, Arkansas and Kansas during January and February, 1929, follow:

Fields	January Totals	February Totals
Wewoka,Cromwell	1,030,537	941,651
Healdton	213,954	187,103
Hewitt - Graham	141,615	133,894
Cushing	110,814	96,918
Seminole District	85,854	66,732
Yale	44,609	37,216
Augusta (Kansas)	34,088	32,484
Duncan	29,631	.....
Walters-Beaver Cr'.k	4,603	.....
Burbank	84	87
Totals for Oklahoma and Kansas	1,695,789	1,496,085
Luling District	319,837	287,285
Mirando District	218,326	130,012
Winkler County	111,902	125,944
Crane County	122,192	122,555
Roberts-Howard County (Deep)	116,582	101,027
Electra	95,010	82,815
Panhandle District	86,336	78,705
Burkburnett	66,481	61,625
Lockhart-Lytton Springs	37,184	33,797
Archer County	24,956	20,865
Iatan & Howard shallow	24,756	21,146
Mexia-Wortham	22,020	19,152
Desdemona-Comanche County	16,665	13,641
Corsicana-Powell	11,744	9,749
Ranger-Olden	9,144	8,222
Corsicana (Heavy)	8,561	7,267
Stephens County	8,509	7,612
Petrolia-Clay County	2,510	2,072
Thrall-Williamson County	1,057	977
Panola County	642	1,832
Shelby County	306	....
Totals for Texas	1,304,720	1,136,300
Hackberry	139,900	111,305
Bull Bayou	41,794	37,109
Pine Island	30,284	26,195
Cotton Valley	23,092	20,281
Haynesville	2,538	2,333
Totals for Louisiana	237,608	197,223
Rainbow	86,985	64,698
Smackover	72,131	66,574
El Dorado	11,376	10,439
East El Dorado	4,224	2,554
Totals for Arkansas	174,716	144,265
Totals for five states	3,412,833	2,973,873

Abstracts of Papers on Technical Program

of the

American Association of Petroleum Geologist's Fourteenth Annual Meeting

Fort Worth, Texas, March 21-23, 1929

STRUCTURAL DEVELOPMENT IN THE TEXAS PERMIAN

By Robin Willis

MOST of the structural relief of the oil-producing formations of the Texas Permian was developed in Permian time, during and immediately after their deposition. This is shown not only by the thickening and thinning of Permian beds, but also in lateral variations in the character of the sediments, controlled by the growing folds. Certain important changes in Permian structures, however, have been effected by later, probably Tertiary, movements.

Two types of folds are recognized, those controlled by settling of basins around pre-Cambrian positive elements such as the Panhandle arch, and those formed by actual deformative movements, of which the Winkler County "high" is probably an example. It is probable that the forces involved in the latter were horizontal rotation, rather than simple compression, and the pattern of the folds suggests that they are controlled by a system of shears in the pre-Cambrian basement, local variations being due to differences in and varying resistance offered by the basement. It can be shown that some of the axes of the latter type have been shifted by post-Permian movements, which were probably controlled by an entirely different set of forces, though possibly localized on the same shear lines that controlled the Permian folds.

STRATIGRAPHIC CONTROLS IN THE TEXAS PERMIAN

By Robin Willis

CONTROL of Permian stratigraphy can be classified under the following heads: climatic control, determining in general the salt-basin and red-bed types of deposition; geographic control, determining the distribution of clastic and chemical sediments in relation to land masses, the character of clastic sediments through their sources, and the salinity of chemical sediments through the distance from the outlet to marine conditions; and structural control, exercised on chemical sediments, through barriers and through differences in salinity in deep and shallow waters, and on clastic sediments by the localization of currents and other agencies of deposition.

Four divisions of the Texas and New Mexico Permian, the Wichita-Albany, Clear Fork, Blaine, and post-Blaine periods of deposition, are considered in their relation to these controls.

PRE-PENNSYLVANIAN STRATIGRAPHY OF THE FRONT RANGE IN COLORADO

By A. E. Brainerd, H. L. Baldwin and I. A. Keyte

THIS paper deals with a summary of the pre-Pennsylvanian conditions on the Front Range in Colorado, together with new classifications by the authors. The section at Beulah shows the occurrence of Fremont and a new unit called the Beulah formation which is tentatively placed as upper Devonian. The section at Colorado Springs is reclassified. Mid-Continent equivalents are suggested for all the units listed.

NOTES ON THE PENNSYLVANIAN SECTION AT LOST LAKE, COLORADO

By A. E. Brainerd, I. A. Keyte and H. L. Baldwin

IN 1902, W. T. Lee published a short paper "Notes on the Carboniferous of the Sangre de Christo Range, Colorado." The present paper deals with a similar though much more complete and detailed section taken in the Lost Lake district on the Sangre de Christo Mountains. A detailed section is given together with the fauna. Correlations are given.

THE CRETACEOUS-TERTIARY UNCOFORMITY IN VENEZUELA

By William F. Jones and W. L. Whitehead

UNCONFORMITY between the Tertiary and the Cretaceous in Venezuela has been inferred for some time but never actually described. By some writers this unconformity has been considered as probably local disconformity. Liddle in his book assumes angular unconformity. It is doubtful if any geologists who have published on Venezuela have actually seen the unconformity as shown in this illustration. Such a relationship can indicate nothing else than a widespread unconformity of marked angularity between the Tertiary and Cretaceous of northern South America.

STRUCTURAL FEATURES OF THE WEST FRANKLIN FORMATION OF SOUTHWESTERN INDIANA

By Robert Shrock and Clyde A .Malott

THE West Franklin limestone formation, occurring approximately 900 feet above the base of the Pennsylvanian (300 feet above Coal V) and approximately 350 feet below the highest formation in Indiana, is used in this report to determine the structural conditions in its outcrop area in southwestern Indiana. It is traced into Illinois on the north and into Kentucky on the south. The regional structure conforms with the general southwesterly dip shown by all of the formations in southwestern Indiana. In the southern part of the outcrop area, however, the uniform regional dip is locally complicated by small low domes or anticlines and shallow basins or synclines. These small structures are thought to have been formed by differential compacting of muds and other sediments over and about a large mass of sand.

ROLE OF GEOLOGIC STRUCTURE IN THE ACCUMULATION OF PETROLEUM

By Frederick G. Clapp

THIS paper is intended to summarize and correlate the results of the papers included in the association's symposium on geologic structure, of which the two volumes are in press, and to appear as the closing chapter of Volume 2. Since the paper is written for a definite purpose, the examples quoted therein are drawn largely from the symposium. Although, on casual reading of those papers, a large part of them may seem to depart in some particular from recognized structural principles, we must not be misled by the seeming "exceptions" into supposing that they constitute a departure from such principles. It is generally apparent that the accepted relations of oil to structure prevail universally, subject to the existence of other fundamental criteria, and the advance of our science during the past few years emphasizes the existence of many factors that were formerly unsuspected, all of which may effect the position of oil on or in relation to favorable areas. Every so-called "exception" is found to clinch the structural principles more firmly than before, and we can go forward with a greater degree of indulgence of our difficulties and a keener appreciation of pit-falls and the means of avoiding them.

(Continued on page 70)

THE MERCURY METHOD FOR THE MEASUREMENT OF THE VOLUME OF ROCK SPECIMENS IN POROSITY DETERMINATIONS

By W. B. Gealy

A METHOD is described wherein mercury is used in porosity determinations to measure the volume of the rock chunk. Since mercury does not enter the pores of a consolidated rock, it is not necessry to dip the specimen in paraffin. The volume is measured in a Russell porosity apparatus, mercury, rather than acetylene tetrachloride, being used. The use of mercury saves time and eliminates the error of estimating the outer surface of the specimen. Comparisons with results obtained by dipping the specimen in paraffin and weighing in water show that the method is quite accurate.

NOTES ON THE OIL FIELDS AND STRUCTURE OF THE SWEETGRASS ARCH, MONTANA

By Thomas B. Romine

THE oil fields of the Sweetgrass arch are so situated, geographically, that their development has been unaffected by the general depression of the oil business during the past two years. For this reason considerable activity has taken place and attempts have been, and are being, made to locate new pools.

The oil in the Sweetgrass arch fields occurs locally on minor folds situated on the arch, and the greater part of the production is found at the top of the Madison limestone (Mississippian). Productivity is determined largely by the existent porosity at the top of the Madison.

Large areas on the Sweetgrass arch remain untested, especially those in which surface structure is obscured by glacial drift. Such areas are worthy of intelligent prospecting in an attempt to locate local structure.

THE GEOLOGY OF THE LARREMORE AREA, CALDWELL COUNTY, TEXAS

By Albert William Weeks

THE paper covers the geology of the structure upon which the Larremore oil field is located. This field is also known as the Jolly or Roxana field as the discovery well was drilled on the A. W. Jolly farm, C. Crenshaw Survey, by the Shell Petroleum Corporation. The oil is obtained from the Edwards limestone encountered at a depth of approximately 1285 feet. This is the second Edwards limestone field discovered in the United States.

CARBON-RATIOS AND OIL GRAVITIES IN THE ROCKY MOUNTAIN REGON

By C. E. Dobbin

ATTENTION is called to the great variation in the gravity (Baume) of the oil from the same formation in different parts of the Rocky Mountain region, from the same formation in one field, and from different formations in the same field. It is shown that carbon-ratios do not everywhere indicate the rank of a coal or the degree of dynamic metamorphism which the rocks have undergone.

STRUCTURAL GEOLOGY AND STRATIGRAPHY OF SOUTHWEST OKLAHOMA

By Clyde M. Becker

A DISCUSSION of Wichita Mountain uplift and its relation to producing oil and gas structures. Accompanied by structural contour map and cross-sections.

Cross-section showing producing horizons of known fields, brief discussion. Possibilities for deeper oil and gas production as indicated by stratigraphy of Wichita Mountains: cross-section.

Undeveloped favorable structural areas. Structural contour map. Transitions in stratigraphy of Permian as a guide to proper correlations and structural mapping.

THE TRIASSIC OF WEST TEXAS

By John Emery Adams

THE Dockum series, of upper Triassic age, overlies much of the oil-producing area in the southern part of the Permian basin, in West Texas and southeastern New Mexico. In the area south of the 33rd parallel the Dockum consists of red and non-red conglomerate, sandstone, and shale beds of terrestial origin. An examination of the series in well samples shows that it is composed of two formations. The names Santa Rosa and Chinle, as used for the Triassic of central New Mexico, are extended to include the equivalent formations in the Texas section. A critical study of the means used for separating the red beds of the Triassic and Permian shows that the gravel and non-lithified shales of the Triassic and the thick beds of very fine sandstone and hard shale of the Permian are the most prominent features.

UNCONFORMITIES IN THE UPPER CRETACEOUS SERIES OF TEXAS

By L. W. Stephenson

THE Upper Cretaceous or Gulf series of Texas is separated from the Comanche series below, and from the Eocene series above, by major unconformities. Unconformities within the series have not heretofore been generally recognized, although several of them have been indicated in previous publications. These stratigraphic breaks are recognized in part by physical features at the contacts, and in part by the absence of lithologic members and paleontologic zones which would be expected to be present in the sections had there been no emergence and erosion. Descriptions and illustrations are given of specific localities at which unconformities have been observed at the bases of the Eagle Ford clay, the Austin chalk, the Taylor marl, the Pecan Gap chalk, and the Navarro formation. These unconformities, and numerous minor interruptions to sedimentation (diastems) record differential warping off of flanks of, and between, the Llano-Burnett and Ouachita uplifts, the resultant transgressions and regressions of the sea.

THE HOTCHKISS DIP: A NEW MAGNETOMETER

By Noel H. Stearn

THE purpose of this new instrument is to aid in the search for valuable mineral deposits. The history of the instrument culminates in an intensive testing period of 2½ years during which time it has been tested in the field in Arizona, Old Mexico, New Mexico, Texas, Oklahoma, Arkansas, Kansas, Missouri, Illinois, and Wisconsin.

In principle, the instrument is designed to measure slight variations in the earth's magnetic field.

The construction of the instrument is designed to withstand rough field use.

The manipulation of the instrument has been simplified to the utmost extent commensurate with reliable results.

The corrections for very precise work are made by combing out the effects of temperature, diurnal variation, latitude, and longitude.

The sources of error, including manipulative, mechanical, and magnetic sources have been evaluated as closely as possible to date.

The field procedure routine has been evolved to eliminate lost motion.

The application of the instrument to the oil business is exemplified by a picture of the results of a survey made in the Panhandle of Texas, drawn in isometric form.

TABLES OF TERRANE CORRECTION

By Donald C. Barton

THESE tables are submitted as a slight refinement and improvement of the graphical methods of calculation of the terrane correction. The area beyond five meters from the instrument is divided: (a) into octants, and into zones limited by circles of 5, 7.3, 10.8, 23.2, 34.1, 50, 73, 108, 159, 232, 341, 500, * * * meters radius, where the radius of any circle is ——— times the next inner circle. Each zone is divided into a series of vertical curvilinear prisms which

"I Guess That's The Last Of That Bit"— But It Wasn't

IT was a new bit for the driller. He didn't like the design and he didn't know the steel. So he decided to kill the bit as quickly as he could.

The log showed some mighty tough boulders ahead. After getting up speed in a few feet of soft formation he opened his engine wide. When he hit the boulders, instead of slowing up to give the bit a chance, he kept it going at full speed.

As he started to come out of the hole, he remarked to one of the boys on the floor, "I guess that's the end of that bit." But, it wasn't. The bit was practically unharmed. Back in the hole it went—for more than an hour at top speed in some of the meanest formation in the field.

When the bit came out the second time, the driller examined it carefully. It was still good for additional service. "I'm sold," admitted the driller. "That's *some* bit."

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are the projections of the series of prisms of the 5 to 11 (or 5 to 7.3) meter zone. The corresponding prisms of the different zones all produce the same gradient (and differential curvature) at the origin. By tabulating the corresponding elevations of the 5 to 11, 11 to 23, and 23 to 50 meter zones and the corresponding gradient and differential curvature (and similarly for the case "b"), it is possible to construct a compact and very usable table, which is easily usable out to all distances from the instrument beyond five meters. The tables presented are designed for moderately rough topography which, however, does not rise (or sink) more than 12 in 100 above (or below) the level of the instrument.

Similar tables can be prepared for rougher topography or for the calculation of the effects of subsurface anomalies of mass. These tables have the advantage over graphs that the gradient and differential curvature can be calculated simultaneously and have the disadvantage that vertical heterogeneity of mass is not handled so easily as by the graphs. A somewhat similar table is presented for calculation of the effects produced by an infinitely long straight railroad embankment or ditch.

LEAST SQUARE ADJUSTMENT OF MAGNETOMETER AND TORSION BALANCE SURVEYS

By Donald C. Barton

IN detailed magnetometer or torsion-balance surveys, or wherever the observations are not taken in a single isolated linear profile and where observations are close together or one set of observations approach another set, it is necessary to adjust the observations in order to eliminate as much as possible the incongruities. Except in rough work, or in very simple cases, this adjustment is best done by least square adjustment, which however is rather tedious and requires an experienced calculator. The formulae can be worked out for certain set types of arrangements of stations and case in rule of thumb calculation forms. For certain types of surveys, a primary net of stations can be adjusted quickly and then the other stations adjusted to that net. By the proper planning of a detailed magnetometer survey and the use of least square adjustment, much of the checking-back at present can be eliminated. Tabulated rule of thumb formulae for certain cases are presented.

THE OIL WELL DECLINE FORMULA; HYBERBOLIC OR POLYNOMIAL?

By Roswell H. Johnson

FOR an oil-well decline curve to be either exponential or of the hyperbola class requires a small number of causative factors all operating at a constant rate or at a systematically changing rate throughout the whole life. On the contrary if we leave out the flowing period and a late rejuvenated period, still the number of factors that operate are so numerous and their relative effectiveness so changes with age that theoretically a polynomial formula seems probable as it can be found with less uniform conditions. An attempt is made to analyze a few of the causative factors with reference to time. By means of the loss ratio method some actual curves are analyzed. Comparative results of extrapolation of the late years on the hypothesis of exponential, hyperbolic and polynomial formulae are then shown.

THE SHALE GAS INDUSTRY OF EASTERN KANSAS

By Homer H. Charles and James H. Page

NATURAL gas from carbonaceous shales is now produced in Eastern Kansas where sand gas alone formerly furnished the supply. The wells have an average initial volume of 40,000 cubic feet and the gas is almost invariably accompanied by salt water. This paper describes the shales in which the gas occurs, the composition of the gas, its probable source, and reasons for the variation in open flows. The drilling, equipment, and operating of the wells is discussed. The regulation of the line pressure against which the wells feed is the chief operating problem. Shale wells show a decline in production, which is ordinarily very gradual, but ultimate exhaustion is to be expected. The industry owes its existence to the excellent industrial and domestic markets throughout the gas-bearing area.

THE MONTEREY GROUP OF CALIFORNIA

By J. E. Eaton

THE Monterey group embraces in maximum sections approximately 10,000 feet of marine and brackish-water sediments in part derived from organic remains, laid down in fairly warm and shallow lagoonal seas during the first three-quarters of Miocene time. The succession is commonly thought to be the chief source of enormous quantities of petroleum which have been produced from within and above it in California.

The group is divisible into three formations, reading upward, the Vaqueros, Tembler, and Monterey Shale. The last mentioned is the typical horizon. All three divisions are in part arenaceous. They differ in source of materials and in textural aspect of the prevailing fine-grained component, which latter is respectively dark clay shale, hard siliceous shale, and soft diatomite.

In some areas the group is apparently conformable throughout, and even gradational into later deposits. In other areas the upper formation or Monterey Shale reveals unconformity at both its base and top.

It is concluded that the Monterey group of California is a related organic succession embracing three mappable horizons separable from one another by paleontology, derivation, and general field aspects.

UNDERGRADUATE PREPARATION FOR THE GEOLOGIST

By Ellis W. Shuler

Results of a questionnaire sent to one hundred oil geologists.

A CORRELATION OF PERMIAN OUTCROPS ON THE EASTERN SIDE OF THE WEST TEXAS BASIN

By A. M. Lloyd and W. C. Thompson

THIS paper consists of a correlation and brief description of Permian outcrops of West Texas in an area extending from Cretaceous rocks in Taylor and Nolan Counties northward to Red River. Outcrops in the different counties were traced in the field by the authors and secured from various company and independent geologists, and a map was compiled showing the correlation and trace of the principal beds in detail. Columnar sections across the outcrops are used to illustrate the vertical relation of beds in different parts of the area. Names have been suggested for certain members previously known by different names. A gradual thinning in the beds of the Clear Fork and Blaine is shown both by the areal distribution of the formations and a comparison of the measured areal distribution of the formations and a comparison of the measured sections. Aside from its use in areal geology, the map will be helpful in subsurface correlations in that it will show the approximate position in the geologic section of the starting point of any wells or tests within its boundaries.

THE GEORGETOWN FORMATION OF CENTRAL TEXAS AND ITS NORTH TEXAS EQUIVALENTS

By Robert H. Cuyler

THE Georgetown formation in Central Texas is 80 feet thick. As it is traced north, the formation is found to thicken to 410 feet at Red River. This total thickness of "Georgetown" in north Texas is divided into seven formations. In this paper, the writer traces all of the North Texas equivalents in order to determine exactly how thick each of the north Texas formations is in the Central Texas Georgetown beds.

In determining the exact thickness of each of the Georgetown equivalents in Central Texas, *an entirely new idea is presented and proved.* By means of paleontologic investigation it is shown that the formation which lies at the bot-

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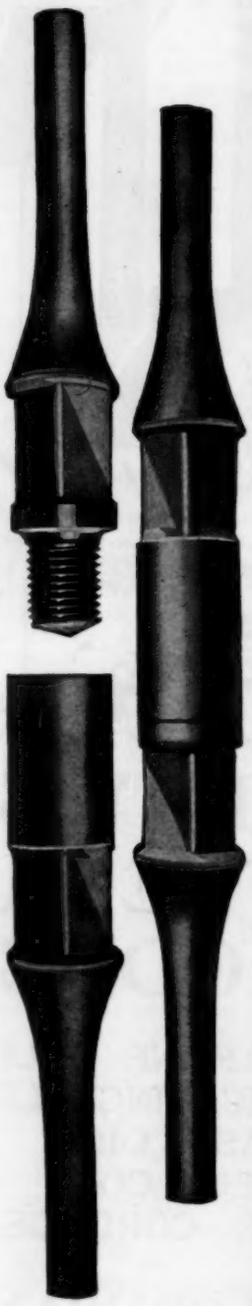

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tom of the section in the Washita group of North Texas, namely, the Kiamichi clay, is not a member of this group, but belongs to the Fredericksburg group beneath it. Also, the actual thicknesses of the North Texas formations are accurately correlated with the Central Texas equivalents.

(1) The Main Street formation of North Texas is represented at Austin by approximately 15-20 feet of limestone ledges in the upper one-fourth of the Georgetown formation.

(2) The Pawpaw formation of North Texas is lacking in the Austin region.

(3) The Weno formaoitn of North Texas thins, thickens, and again thins southward from Red River and is represented at Austin by approximately 10-15 feet of limestones.

(4) The Denton formation of North Texas is represented at Austin by only a thin ledge of limestone rich with *Gryphaea washiteansis* Hill.

(5) The Fort Worth formation is the best represented of all North Texas equivalents of the Georgetown of Central Texas, and has approximately 30 feet of Fort Worth sediments at Austin.

(6) The Duck Creek formation of North Texas is traceable southward to Austin where its thickness is approximately 30 feet.

(7) The Kiamichi clay of North Texas thins rapidly southward and at Austin is represented by only a few feet of shaly marls and instead of being an equivalent of the Georgetown of Central Texas, is equivalent to the upper Edwards formation of this region.

GEOLOGY OF EAST TEXAS WITH A DISCUSSION ON SALT MOVEMENTS AND WITH SPECIAL REFERENCE TO MT. SYLVAN SALT DOME

By E. A. Wendlandt and G. Moses Knobel

THIS paper includes a discussion of the Lower Claiborne in order to show the different divisions of this group, old names of formations being redefined and such new names being added as have been found necessary to meet present-day thought.

Mount Sylvan salt dome is in the Western part of Smith County, Texas. The existence of a dome was verified by the seismograph, and later detail work has likewise shown the presence of a dome in this area, although no drilling has been done.

The authors also discuss the structural features accompanying the formation of this dome, which are believed to be the result of salt movement into the core. Similar conditions have been observed in other domes in the East Texas district. The original salt bed is believed to be more than 1,000 feet in thickness and is probably 10,000 feet or more below the surface. The salt movement is believed to originate along points of weakness. This initiating movement, plus isostatic pressure, and the downward push of a settling basin cause the upward movement of the plastic salt. The domes occur in local synclinal areas in the main East Texas geosyncline, and are commonly flanked by more or less well-developed rim synclines. The rim synclines are believed to be due to settling, influenced by a thinning of the original salt series by movement into the stock.

Texas Oil Directory

The first edition of the Oil Directory Publishing Company, Inc.'s directory on oil companies, operators and all concerns allied with the oil industry within the State of Texas is now available for distribution at its office in the W. T. Waggoner building, Fort Worth, and Central National Bank building, San Angelo, Texas. This concern was organized recently by a group of oil men headed by Lloyd Nash, who formerly was with the Gulf Production Company, and the book will be published annually, while subscribers are to be furnished with a mid-year supplement carrying additions and changes.

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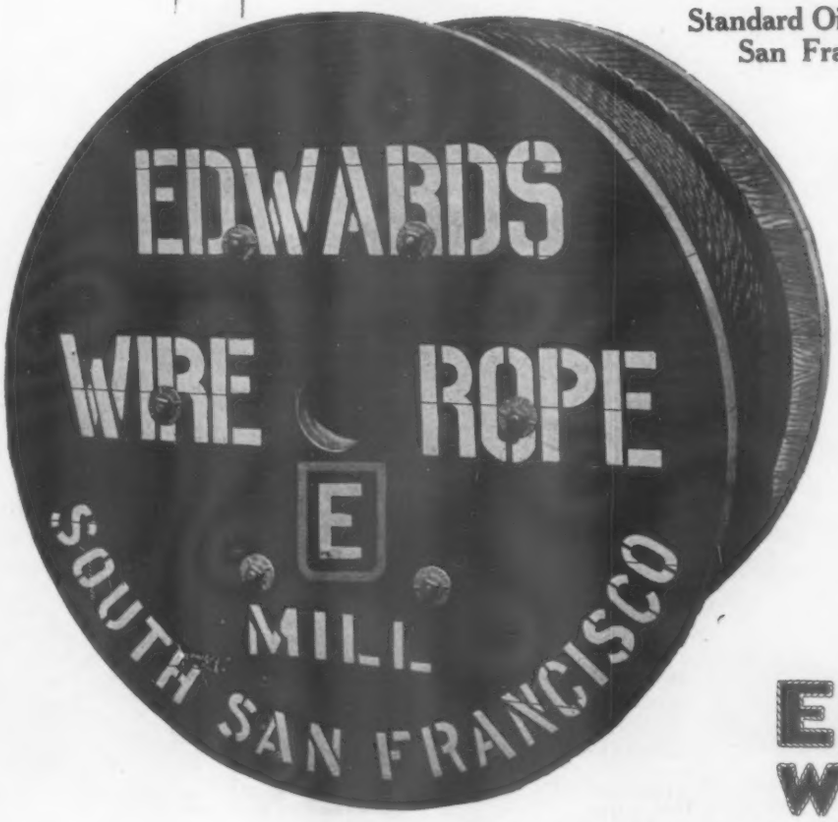

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Say you saw it in The OIL WEEKLY

Summary of Field Operations for February, 1929

RECAPITULATION — ENTIRE UNITED STATES

Section	Completions	Producers	Gas Wells	Failures	Initial Prod. Oil	Initial Prod. Gas	Monthly Prod.
Oklahoma	241	136	30	73	97,827	376	20,013,900
Kansas	36	12	3	21	3,090	3¾	2,682,150
Texas Outside Gulf	475	262	28	185	170,302	1316	18,013,900
Gulf Coast	97	57	2	38	35,776	30	3,984,750
North Louisiana	26	3	10	13	122	125	999,250
Arkansas	24	13	3	8	1,540	105	2,089,000
Eastern	440	255	74	101	11,789	139	3,039,050
Rocky Mountain	...	...	...	...	...	...	2,009,600
California	95	92	...	3	175,625	....	22,338,600
United States Total	1,434	830	150	442	236,071	2,114¾	75,170,200
January	2,068	1,221	262	582	746,564	1,045	81,702,750

EASTERN STATES

NEW YORK

Field—	Completions	Producers	Gas Wells	Failures	Initial Prod. Oil	Initial Prod. Gas
Allegany	14	14	..	..	42	....
Total	14	14	..	..	42	..

PENNSYLVANIA

Allegheny	2	2	..	..	14	..
Beaver	1	1	..	..	12	..
Bradford	75	70	..	5	238	..
Butler	9	6	3	..	511	20¼
Center-Middle	4	4	..	..	16	..
Clarion	5	3	2	..	24	3
Greene	13	..	11	2	..	16½
Venango	10	9	1	..	18	½
Washington	2	2	..	..	240	..
Westmoreland	1	..	..	1	..	..
Total	122	97	17	8	1073	40¼

CENTRAL OHIO

Ashland	11	3	4	4	65	5
Athens	11	2	4	5	8	1¾
Coshocton	2	1	..	1	2	15¾
Cuyahoga	1	..	1	..	..	¼
Fairfield	1	..	1	..	..	¼
Gallia	1	..	1	..	..	¼
Guernsey	4	1	2	1	25	1½
Hocking	7	3	..	4	65	..
Holmes	4	3	..	1	84	1¼
Jackson	5	..	3	2	..	2¾
Knox	3	..	1	2	..	¾
Lawrence	1	..	1	..	..	2
Licking	11	9	1	1	83	¼
Lorain	2	..	2	..	..	6¾
Medina	4	1	..	3	12	..
Meigs	6	3	1	2	38	½
Muskingum	5	4	..	1	422	¼
Perry	12	10	..	2	864	..
Richland	1	..	1	..	..	10¼
Summitt	8	..	3	5	..	12¾
Vinton	1	..	1	..	..	1½
Wayne	5	..	4	1	..	2½
Total	106	40	31	35	1668	66¼

SOUTHEASTERN OHIO

Belmont	1	1	..	..	3	..
Carroll	1	..	..	1	..	..
Monroe	9	3	2	4	8	¾
Morgan	9	..	9	..	..	6½
Noble	6	3	2	1	15	¾
Washington	12	6	5	1	46	4
Total	38	13	18	7	72	12

NORTHWESTERN OHIO

Allen	1	1	..	..	15	..
Drake	1	1	..	..	8	..
Hancock	2	2	..	..	75	..
Hardin	1	..	..	1	..	..
Mercer	1	..	1	..	..	¼
Seneca	3	1	1	1	20	¼
Wood	1	..	..	1	..	..
Total	10	5	2	3	118	½
Total Ohio	154	58	51	45	1858	78¾

WEST VIRGINIA

Field—	Completions	Producers	Gas Wells	Failures	Initial Prod. Oil	Initial Prod. Gas
Boone	4	2	2	..	4	2¼
Cabell	1	..	1	..	..	1
Calhoun	13	..	11	2	..	14
Clay	1	..	1	..	..	¼
Doddridge	3	1	1	1	10	¼
Gilmer	6	2	4	..	10	3½
Harrison	3	..	3	..	..	33¼
Jackson	3	3	..	..	123	..
Kanawha	2	..	2	..	..	13¼
Lewis	1	..	1	..	..	2½
Lincoln	15	..	14	1	..	63¾
Logan	3	..	3	..	..	2¼
Marion	1	..	..	1	..	..
Mingo	2	..	2	..	..	63¾
Monongalia	2	..	2	..	..	1
Pleasants	1	..	1	..	..	¼
Putnam	2	..	1	1	..	¼
Ritchie	11	3	7	1	22	3¾
Roane	9	5	4	..	136	5
Tyler	3	..	2	1	..	1
Wayne	2	..	1	1	..	1¼
Wetzel	1	..	..	1	..	..
Total	89	16	63	10	305	60½

KENTUCKY

Allen	8	3	..	5	29	..
Barren	1	1	..	..	10	..
Breckenridge	1	..	..	1	..	..
Clay	1	..	1	..	..	2
Daviess	30	18	..	12	611	..
Estill	10	8	..	2	20	..
Hancock	1	1	..	..	25	..
Hardin	1	..	..	1	..	..
Henderson	1	1	..	..	20	..
Hopkins	2	..	..	2	..	..
Johnson	1	1	..	..	15	..
Knox	1	..	..	1	..	..
Lee-Owsley	1	..	1	..	..	1½
Magoffin	2	2	..	..	45	..
McLean	1	1	..	..	20	..
Ohio	35	21	1	13	954	2
Powell	1	1	..	..	6	..
Warren	4	3	..	1	7	..
Wayne	4	1	..	3	2	..
Total	106	62	3	41	1764	5½

INDIANA

Gibson	2	2	..	..	15	..
Grant	1	..	..	1	..	..
Vigo	1	1	..	..	30	..
Total	4	3	..	1	45	..

ILLINOIS

Clark	1	..	..	1	..	..
Crawford	1	1	..	..	2	..
Lawrence	3	1	..	2	80	..
St. Clair	2	1	..	1	105	..
Wabash	2	..	..	2	..	..
Total	9	3	..	6	187	..

(Continued on page 78)

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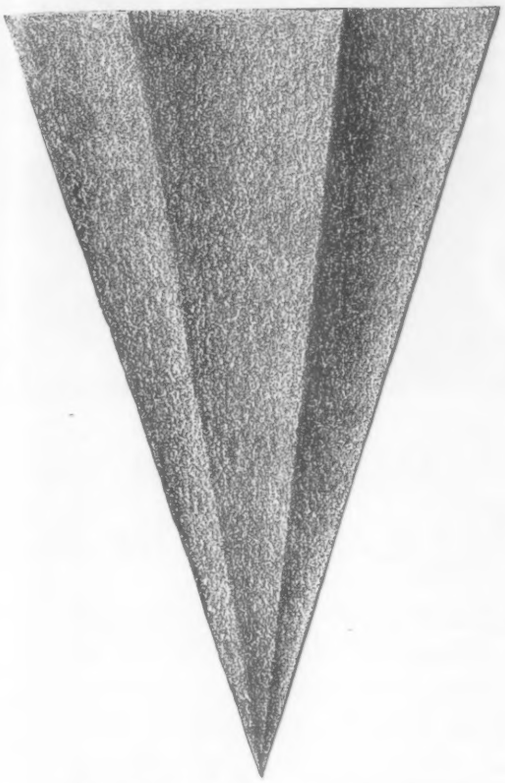

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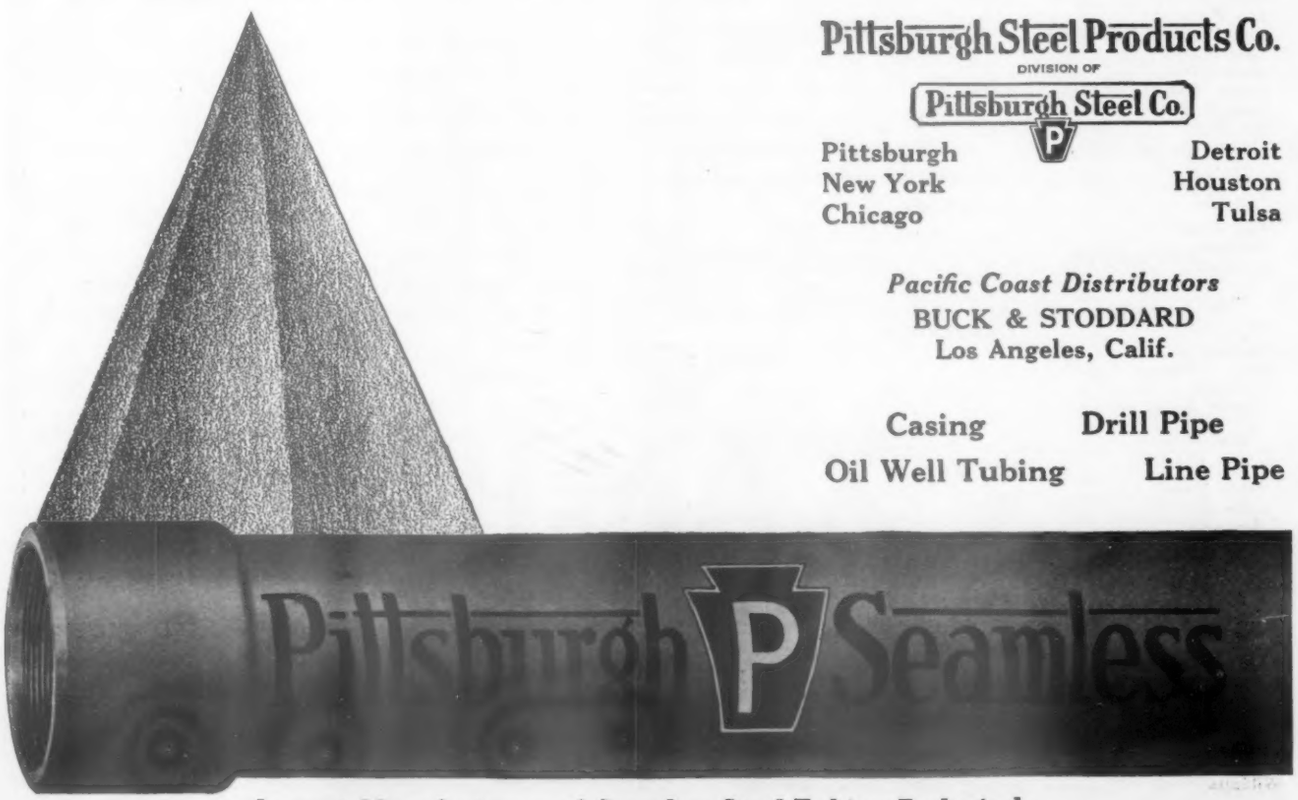

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Say you saw it in The OIL WEEKLY

(Continued from page 76)

MICHIGAN

Field—	Completions	Producers	Gas Wells	Failures	Initial Prod. Oil	Initial Prod. Gas
Muskegon	30	18	3	9	6820	14½
Oceana	1	..	..	1	..	..
Total	31	18	3	10	6820	14½
Total Eastern Fields	440	255	74	101	11,789	139

Total Prod. Eastern Fields 3,039,050

CALIFORNIA

Field	Completions	Producers	Gas Wells	Failures	Initial Prod.
Athens-Rosecrans	1	1	..	..	450
Belridge	1	1	..	..	50
Elwood-Goleta	1	1	..	..	5,600
Fruitvale	3	3	..	..	1,175
Huntington Beach	9	9	..	..	8,457
Kern Front	4	4	..	..	875
Long Beach	13	13	..	..	11,100
Montebello	1	1	..	..	150
Poso Creek	3	3	..	..	1,300
Rincon	1	1	..	..	325
Santa Fe Springs	46	46	..	..	135,850
Seal Beach	6	6	..	..	7,975
Ventura	3	3	..	..	2,300
Wildcats	3	..	..	3	....
Total	95	92	..	3	175,625

CALIFORNIA PRODUCTION SUMMARY

Santa Fe Springs	5,388,000
Long Beach	5,036,000
Huntington Beach	1,341,000
Torrance	420,000
Dominguez	280,000
Rosecrans	185,500
Inglewood	746,500
Midway-Sunset	2,044,000
Ventura	1,550,000
Seal Beach	903,500
Elwood-Goleta	639,000
Kettleman Hills	104,200
Others	3,700,900
Total	22,338,600

MOUNTAIN STATES PRODUCTION SUMMARY

WYOMING

Salt Creek	929,150
Grass Creek	62,400
Elk Basin	20,100
Big Muddy	63,250
Lost Soldier	94,750
Rock Creek	65,700
Lance Creek	8,400
Oregon Basin	91,150
La Barge	43,500
Others	105,250
Total	1,483,650

MONTANA

Cat Creek	37,700
Sunburst	173,150
Pondera	63,350
Total	274,200

COLORADO

Moffats	29,700
Fort Collins	71,350
Florence	33,700
Others	54,200
Total	188,950

NEW MEXICO

Table Mesa	700
Artesia	26,700
Hogback	9,300
Rattlesnake	22,700
Others	3,400
Total	62,800
Grand Total Mountain States	2,009,600

ARKANSAS

Field—	Completions	Producers	Gas Wells	Failures	Initial Prod. Oil	Initial Prod. Gas
Bradley	1	..	..	1	..	..
Nevada	2	2	..	..	60	..
Ouachita	3	2	..	1	125	..
Union	14	8	2	4	1345	55
Wildcats	4	1	1	2	10	50
Total	24	13	3	8	1540	105

ARKANSAS PRODUCTION SUMMARY

El Dorado	132,800
Champagnolle	280,550
Smackover Light	183,250
Smackover Heavy	1,380,400
Stephens	28,350
Nevada	39,100
Lisbon	41,750
Others	2,800
Total	2,089,000

OKLAHOMA

Field—	Completions	Producers	Gas Wells	Failures	Initial Prod. Oil	Initial Prod. Gas
Caddo	2	2	..	..	35	..
Canadian	1	..	..	1	..	..
Carter	6	5	..	1	260	..
Comanche	1	..	..	1	..	..
Cotton	2	..	..	2	..	..
Creek	27	14	6	7	1447	19½
Garfield	1	..	1	..	..	4
Grady	10	2	4	4	200	44
Grant	1	..	1	..	..	10
Hughes	1	1	..	..	50	..
Jefferson	4	2	..	2	270	..
Kay	7	2	3	2	185	11½
Kiowa	7	1	..	6	25	..
Lincoln	2	..	..	2	..	..
Logan	2	..	1	1	..	13½
Marshall	2	..	..	2	..	..
Muskogee	11	6	..	5	285	..
Okfuskee	10	4	1	5	290	15
Okmulgee	9	5	2	..	72	2
Osage	20	14	1	5	5492	11
Pawnee	2	1	1	..	25	..
Payne	2	..	..	2	..	..
Pontotoc	10	8	..	2	3635	..
Pottawatomie	45	39	2	4	71,051	85
Seminole	34	21	3	10	13,697	143
Sequoyah	1	..	1	..	..	3
Stephens	13	8	..	5	795	..
Texas	1	..	..	1	..	..
Tulsa	1	..	..	1	..	..
Wagoner	6	1	3	2	13	14½
Total	241	136	30	73	97,827	376

OKLAHOMA PRODUCTION SUMMARY

Braman	98,700
Blackwell	116,400
Hubbard	54,150
Thomas	25,050
Tonkawa	299,800
Garber	169,200
Burbank	629,200
Osage	726,400
Cushing	574,300
Yale	214,750
Davenport	45,850
Bristow	531,050
North Okmulgee	402,300
Lyons-Dealer	228,700
Cromwell	223,450
Papoose	96,450
Wewoka	148,950
Seminole	1,025,900
Bowlegs	1,068,900
Searight	259,800
Little River	2,581,050
Earlsboro	1,735,550
Duncan	199,500
Graham	125,150
Fox	42,000
Healdton	365,200
Hewitt	241,200
Scholem-Alechem	373,700
Pearson	47,500
Oklahoma City	152,900
St. Louis	3,305,500
Allen	794,750
Maud	1,132,400
Logan County	370,950
Others	1,607,250
Total	20,013,900

KANSAS PRODUCTION SUMMARY

Greenwood	622,600
Florence	26,050
Peabody	88,700
El Dorado	341,400
Augusta-Fox-Bush	82,000
Rainbow Bend	29,600
Russell	95,900
Churchill	202,650
Oxford	166,050
Sedgewick	199,800
Others	827,400
Total	2,682,150

(Continued on page 80)

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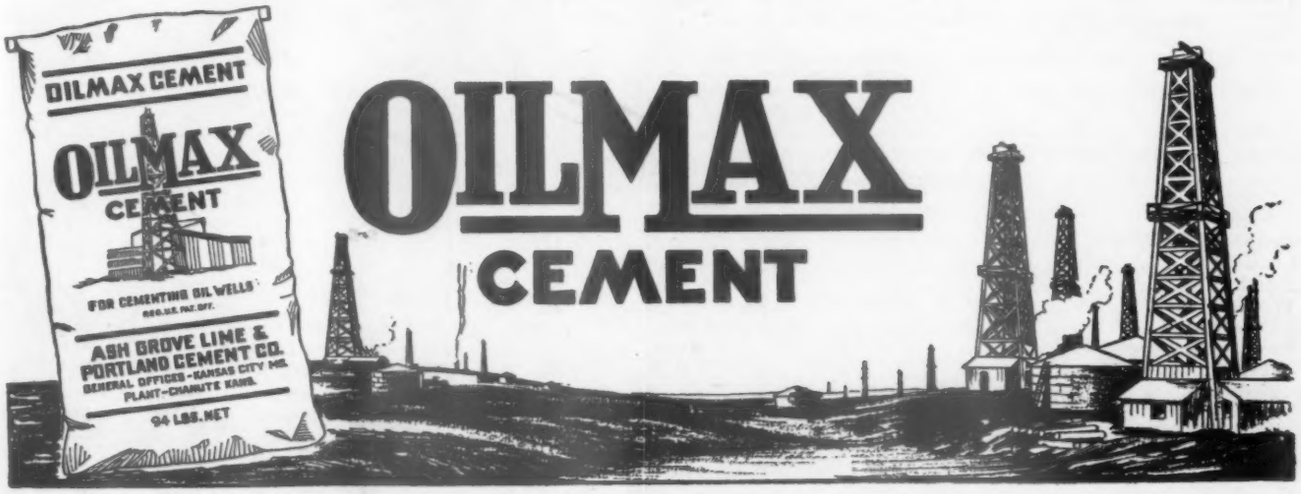

Say you saw it in The OIL WEEKLY

(Continued from page 78)

KANSAS

Field—	Completions	Producers	Gas Wells	Failures	Initial Prod. Oil	Initial Prod. Gas
Butler	6	2	..	4	225	..
Cloud	1	..	..	1	..	..
Coffey	1	..	1	..	..	1½
Cowley	5	1	1	3	2000	1½
Elk	3	1	..	2	50	..
Ellis	2	1	..	1	65	..
Greenwood	8	4	..	4	415	..
Marion	2	..	1	1	..	¾
McPherson	1	..	..	1	..	..
Mitchell	1	..	..	1	..	..
Morris	1	..	..	1	..	..
Russell	2	2	..	..	185	..
Sedgewick	1	..	..	1	..	..
Sumner	2	1	..	1	150	..
Total	36	12	3	21	3090	3¾

NORTH LOUISIANA

Field—	Completions	Producers	Gas Wells	Failures	Initial Prod. Oil	Initial Prod. Gas	Monthly Prod. Oil
Belieview	..	..	..	..	..	..	20,400
Bossier	2	..	1	1	..	1	.....
Caddo	7	3	..	4	122	..	326,000
Cotton Valley	..	..	..	..	..	..	83,750
De Soto-Red River	1	..	..	1	..	..	107,650
Elm Grove	..	..	..	..	..	..	16,800
Haynesville	..	..	..	..	..	..	154,350
Homer	..	..	..	..	..	..	111,850
LaSalle	2	..	..	2	..	..	.....
Morehouse	2	..	2	..	..	14	.....
Ouachita	3	..	3	..	..	26	.....
Pleasant Hill	..	..	..	..	..	..	12,700
Richland	3	..	2	1	..	79	.....
Union	1	..	1	..	..	⅓	.....
Urania	..	..	..	..	..	..	159,200
Webster	2	..	1	1	..	4¼	.....
Wildcats	3	..	..	3	..	..	.....
Others	..	..	..	..	..	..	6,550
Total	26	3	10	13	122	125	999,250

SOUTH LOUISIANA

Bayou Bouillion	..	..	..	..	..	..	9,450
Black Bayou	1	..	..	1	..	..	.....
E. Hackberry	1	..	..	1	..	..	168,450
Edgerly	1	1	..	..	25	..	23,100
Evangeline	1	1	..	..	30	..	22,400
Hackberry	6	2	..	4	850	..	.....
Lockport	2	2	..	..	1740	..	133,250
Sorrento	..	..	..	..	..	..	18,000
Starks Dome	2	2	..	..	190	..	.....
Sulphur	3	..	..	3	..	..	64,000
Sweet Lake	..	..	..	..	..	..	15,750
Vinton	2	1	..	1	150	..	118,000
Others	..	..	..	..	..	..	18,600
Total	19	9	..	10	2985	..	591,000
Total Louisiana	45	12	10	23	3107	125	1,590,250

TEXAS

PANHANDLE TEXAS

Carson	2	1	1	..	200	8	161,050
Cottle	1	..	..	1	..	..	.....
Gray	11	9	1	1	1415	540	599,650
Hutchinson	6	6	..	..	345	40	714,800
Moore	2	1	..	1	20	..	.....
Wheeler	5	..	5	..	..	280	18,450
Others	..	..	..	..	..	..	52,090
Total	27	17	7	3	1980	868	1,545,950

NORTH TEXAS

Field—	Completions	Producers	Gas Wells	Failures	Initial Prod. Oil	Initial Prod. Gas	Monthly Prod. Oil
Archer	29	11	..	18	500	..	487,750
Burkburnett	..	..	..	..	..	..	256,450
Clay	3	1	..	2	15	..	.....
Cooke	14	9	..	5	700	..	271,450
Electra	8	4	..	4	91	..	367,500
Fannin	1	..	..	1	..	..	.....
Haskell	2	..	..	2	..	..	.....
Jack	2	..	..	2	..	..	.....
KMA-Iowa Park	22	14	..	8	1186	..	175,850
Throckmorton	1	..	..	1	..	..	.....
Wilbarger	34	30	..	4	3640	..	761,950
Others	..	..	..	..	..	..	15,000
Total	116	69	..	47	6132	..	2,335,950

WEST CENTRAL TEXAS

Brown	35	14	1	20	422	2	253,300
Callahan	12	9	..	3	233	..	102,500
Coleman	17	7	1	9	1065	1¾	100,950
Eastland	19	5	1	14	1010	8	189,950
Erath	1	..	1	..	..	12	.....
Jack	..	..	..	..	..	..	47,950
Mills	1	..	..	1	..	..	.....
McCulloch	1	..	..	1	..	..	.....
Palo Pinto	4	..	..	4	..	..	11,200
Shackelford	16	10	..	6	879	..	352,200
Stephens	4	1	..	3	25	..	180,500
Throckmorton	..	..	..	..	..	..	19,600
Young	47	30	..	17	653	..	210,100
Others	..	..	..	..	..	..	19,350
Total	157	76	4	78	428	23¾	1,487,600

EAST CENTRAL TEXAS

Boggy Creek	..	..	..	..	..	..	94,550
Corsicana-Powell	..	..	..	..	..	..	267,400
Currie	..	..	..	..	..	..	13,750
Freestone	1	..	..	1	..	..	.....
Limestone	1	..	..	1	..	..	.....
Mexia	..	..	..	..	..	..	163,600
Nigger Creek	..	..	..	..	..	..	16,800
Richland	..	..	..	..	..	..	13,500
Wortham	..	..	..	..	..	..	37,850
Total	2	..	..	2	..	..	607,450

EAST TEXAS

Angelina	1	..	..	1	..	..	.....
Harrison	1	..	1	..	..	1	.....
Panola	7	..	6	1	..	18¼	.....
Wildcats	2	1	..	1	1500	..	.....
Total	11	1	7	3	1500	19¼	.....

WEST TEXAS

Crane-Upton	1	1	..	..	75	..	1,426,000
Crockett	..	..	..	..	..	..	60,600
Howard	25	25	..	..	16,605	..	1,203,350
Jones	6	3	..	3	345	..	187,800
Pecos	2	1	..	1	20,000	..	2,334,750
Reagan	2	2	..	..	410	..	521,400
Winkler	37	32	..	5	102,735	70	4,663,150
Mitchell-Scurry	..	..	..	..	..	..	73,600
Wildcats	18	..	2	16	..	10	.....
Others	..	..	..	..	..	..	46,800
Total	91	64	2	25	140,170	80	10,517,450

(Continued on page 82)

TEXAS RECAPITULATION

Field	Completions	Producers	Gas Wells	Failures	Initial Prod. Oil	Initial Prod. Gas	Monthly Prod.
Panhandle	27	17	7	3	1,980	868	1,545,950
Southwest	71	35	8	27	16,233	325	1,519,500
North	116	69	...	47	6,132		2,335,950
W. Central	157	76	4	78	4,287	23¾	1,487,600
E. Central	2	...	...	2	...	...	607,450
East	11	1	7	3	1,500	19¼	.....
West	91	64	2	25	140,170	80	10,517,450
Total Outside Gulf	475	262	28	185	170,302	1,316	18,013,900
Gulf	78	48	2	28	32,791	50	3,393,750
Grand Total	553	310	30	213	203,093	1,366	21,407,650

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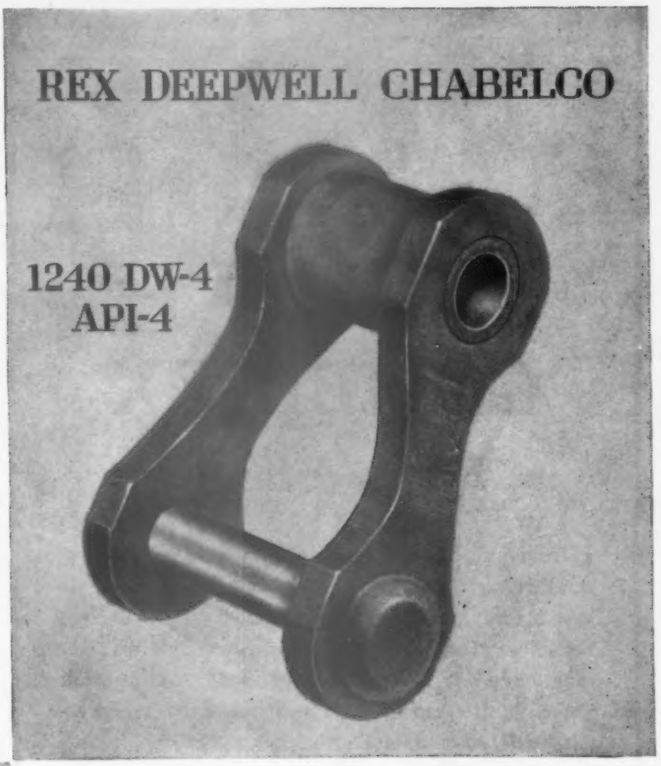

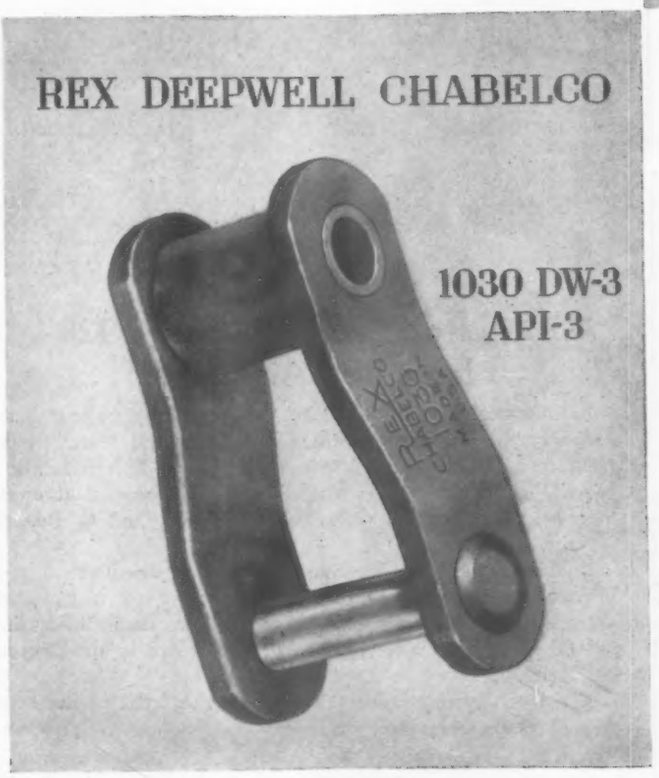

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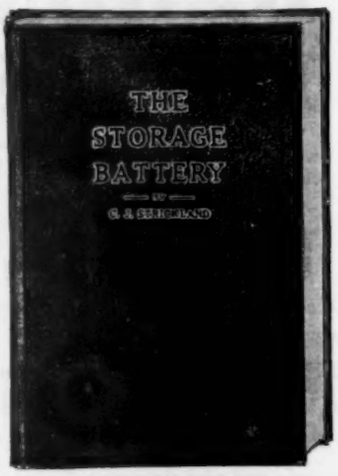

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(Continued from page 80)

TEXAS GULF COAST

Field—	Completions	Producers	Gas Wells	Failures	Initial Prod. Oil	Initial Prod. Gas	Monthly Prod. Oil
Allen Dome	1	..	..	1	..	..	.....
Barbers Hill	3	2	..	1	4730	..	164,950
Batson	3	3	..	..	21	..	37,700
Big Creek	1	1	..	..	600	..	138,200
Blue Ridge	6	5	..	1	2880	..	118,650
Boling	..	..	..	..	..	..	57,000
Brenham	2	1	..	1	5	..	.....
Clay Creek	4	3	..	1	2900	..	.....
Damon Mound	1	..	..	1	..	..	25,150
Fannett	1	1	..	..	2000	..	.....
Goose Creek	4	2	..	2	420	..	180,450
High Island	2	1	..	1	20	..	.....
Hull	4	4	..	..	975	..	280,850
Humble	..	..	..	..	..	..	133,150
Moss Bluff	1	..	..	1	..	..	.....
Nash Dome	2	1	..	1	1000	..	.....
Orange	2	2	..	..	45	..	82,500
Pierce Junction	7	6	..	1	5675	..	336,350
Raccoon Bend	3	2	..	1	650	..	58,650
Refugio	5	1	2	2	700	50	.....
Saratoga	..	..	..	..	..	..	25,750
Sour Lake	1	1	..	..	55	..	82,500
South Liberty	11	7	..	4	2915	..	169,900
Spindle Top	2	2	..	..	2400	..	937,050
Sugar Land	2	2	..	..	800	..	212,450
West Columbia	..	..	..	..	..	..	196,200
Wildcats	10	1	..	9	4000	..	.....
Others	..	..	..	..	..	..	156,300
Total	78	48	2	28	32791	50	3,393,750

SOUTHWEST TEXAS

Caldwell	1	..	..	1	..	..	.....
Cedar Creek	8	6	..	2	3045	..	.....
Dale	..	..	..	..	..	..	19,600
Duvall	6	4	1	..	375	28	.....
Jim Hogg	6	5	..	1	300	..	.....
Kleberg	1	..	..	1	..	..	.....
Laredo District	..	..	..	..	..	..	343,950
Luling	..	..	..	..	..	..	360,350
Lytton Springs	..	..	..	..	..	..	28,000
Nueces	1	..	1	..	..	80	.....
Salt Flat	20	17	..	3	12,350	..	646,300
Somerset	..	..	..	..	..	..	16,800
Webb	16	2	5	9	160	207	.....
Zapata	3	1	1	1	3	10	.....
Wildcats	9	..	..	9	..	..	.....
Others	..	..	..	..	..	..	104,500
Total	71	35	8	27	16,233	325	1,519,500

"Geophysical Prospecting 1929" Issued By A. I. M. E.

"Geophysical Prospecting 1929" is a new 676-page book published by the American Institute of Mining and Metallurgical Engineers, 29 West 39 Street, New York. It represents a compilation of the papers and discussions presented at meetings held at New York, in February, 1928, and at Boston, August, 1928.

Donald H. McLaughlin, chairman of the committee on geophysical methods of prospecting, is author of a two-page preface which will give the reader a comprehensible outline of the rapid rise in importance of geophysics in the mineral industries.

A list of institute officers is given in the front of the book as well as the committee on geophysical methods of prospecting.

General papers covering the subject by Max Mason and Allen H. Rogers head the long list carried in this volume, and papers dealing with electrical methods, magnetic methods, gravity methods and seismic methods follow. Twenty-eight papers, all valuable information for persons interested in geophysical work, are published in "Geophysical Prospecting 1929." Practically all of the papers are illustrated with drawings, and photographs are used for illustration where necessary.

The important part played by geophysics in discovery and outline of minerals in this country, particularly oil reserves, has led to publication of this book, copies of which may be obtained by making inquiry to the institute headquarters.

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Factors in the Design of Portable Seismograph Equipment

(*Continued from page* 30)

instruments are mounted in the rear of the car and entrance is made through a door in the back. It is also quite convenient to mount the instruments directly behind the driver's seat, so that he need only turn around to adjust his instruments. These truck type bodies have two objections. They are, unless very flimsily constructed, heavier than necessary. They are also somewhat top heavy and usually rough riding. Some of the objections to this style body may be overcome by the use of a roadster or coupe body, with a box built on in the space usually occupied by the rumble seat. The instruments are mounted in this box, and the observer operates the instruments, standing on the ground immediately behind the box. This has the disadvantage of the probability of the instruments getting wet during a local shower. In cold weather the efficiency of the observer is decreased due to the necessity of his being exposed while operating.

A very satisfactory instrument car which is being used by several companies, is formed from a standard coach or two-door sedan or new type sedan truck. The rear seat is removed and a framework is built in to support the various instruments. One of the front seats is mounted on a swivel or some similar arrangement, and is turned around and used by the observer. The windows are fitted with dark curtains, in order that he may make the interior semi-dark while actually taking the records. This equipment has the following distinct advantages: 1. Less wear and tear on the instruments due to rough roads. 2. The instruments are protected from the weather. 3. The body may be well ventilated in warm weather, and also made comfortable in cold weather. 4. Daylight is available for repairing and inspecting instruments. (This is a particular advantage over the panel body and the roadster with box on the back.) 5. Papers and data sheets will not be so liable to being blown away by the wind. 6. It is a standard body and requires little alteration. It is a simple matter to reconvert it into a passenger car. 7. It provides more comfort for the observer, and this will lead to a greater efficiency.

V. The sensitivity usually employed with the mechanical type of seismograph is of the order of magnitude of 16000 to 1. This means that a movement of the spot of light on the film of a magnitude of one unit is caused by a movement of the ground equal to one sixteen-thousandth part of a unit. Greater amplification than this may readily be obtained by optical means. However, since it is usual to use a fixed magnification with this type of instrument, (it is very difficult to get a continuous control of the magnification with this instrument) greater amplification will quite frequently result in ruined records due to extraneous disturbances occurring before or during the arrival of the various seismic waves. It is worthy of note, that a low amplitude record, with no extraneous disturbances preceding the seismic waves, is much simpler to analyze correctly than a record which has a great amplitude but considerable disturbance preceding the seismic waves and caused by extraneous earth movements.

In the electrical seismographs, since the amplification may be varied by infinitesimal amounts over a wide range, it is usual practice to provide for an overall amplification of greater than 50000 to 1, and for any given record, to adjust the amplification to the noise level. That is adjust the total amplification until the deflections due to extraneous disturbances, are not noticeable by visual observation of the movement of the spots of light on the film.

The sensitivity of this type of instrument may be controlled in a number of ways. The sensitivity of the detector may be adjusted from the control panel. Variable controls may be placed on the amplifier, or the sensitivity of the oscillograph may be adjusted.

It is common practice to fix the sensitivity of the detector, and control of overall amplification by means of suitable devices incorporated in the design of the amplifier and the oscillograph circuits.

The amplification of a vacuum tube amplifier is a function of the number and type of tubes used, the plate voltage applied on these tubes, and the type of coupling used between stages.

The frequency of the electrical impulses to be amplified has considerable bearing on the type of interstage coupling used. The voltage applied to the plates of the tubes is usually fixed in the design, as is the type of tubes employed. Arrangement can be made however, to cut certain tubes out of the circuit, thereby varying the overall amplification by large steps. A variable resistance may also be shunted across the input or output terminals of the amplifier and used as a means of control.

The sensitivity of the oscillograph may likewise be controlled by a variable resistance connected in the circuit. Such an arrangement allows the use of maximum amplification for satisfactory results under existing conditions and in the end results in a considerable saving in dynamite.

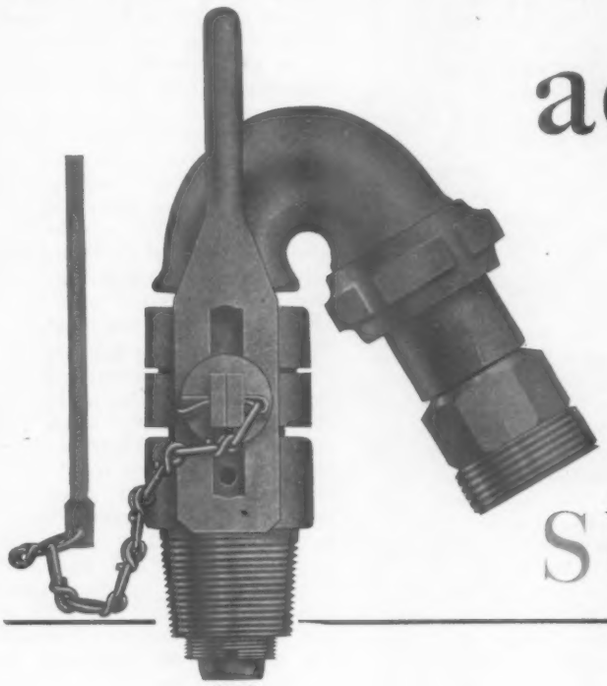
VI. Since the waves transmitted through the different strata have, in general, different frequencies, and since a much greater difference in frequency exists between the seismic waves it is desired to record and those disturbances due to extraneous causes, it is very advantageous to give these various frequencies consideration in the design of seismograph equipment. This is one of the main factors in the success or failure of equipment designed to explore strata by means of the reflected seismic wave.

The only method of adjusting the frequency characteristics of the mechanical instruments is in the adjustment of the natural frequency of the pendulum used. While this tuning of the pendulum will increase the sensitivity of the instrument to the desired frequencies, due to the tendency of the pendulum to oscillate at this natural period, true wave form will not usually be recorded. While this is of secondary importance in work in the Gulf Coast, it is a serious defect when it is necessary to work more complicated structural conditions where it is necessary to pick the events on character.

The frequency characteristics of the electrical instrument may be controlled in a variety of ways. The design of the detector is subject to the same consideration as the design of the pendulum in the mechanical instrument. In addition the characteristics of the electrical device incorporated in this instrument must be given consideration from a frequency standpoint. Furthermore, the amplifier offers an excellent opportunity for both good and bad design from a frequency characteristic standpoint. It should be designed as a band pass amplifier. That is, it should amplify equally well, all frequencies within the range desired to record, but, should amplify to a lesser degree, all frequencies outside this range. This may be accomplished either in the design of the amplifier itself or by incorporating a band pass filter in the input or output circuit, preferably the latter.

The frequency characteristics of the electrical seismograph may be still further controlled by the oscillograph. It is quite possible to design an oscillograph which is particularly sensitive to the desired frequencies and relatively insensitive to other frequencies. It is not to be understood that the electrical seismograph will record absolutely true wave form. The fact that the output of the detector is a function of the velocity of the earth movement rather than the amplitude of the earth movement, and other factors makes this improbable. However, it will record a wave form that shows character, and which is relative. Since any analysis based on character of the waves recorded is of necessity based on empirical data, it follows that similar movements will produce similar records. The trueness of the wave form is of secondary consideration at the present stage of development of seismograph technique.

VII. The importance of sufficient damping, in certain types of seismograph work, cannot be over emphasized. In salt dome work in the Gulf Coast, where the



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most important criteria is the time of arrival of the first event, later events are only of passing interest. However, in work on complicated structural conditions, where it may be necessary to base all conclusions on later events, picked by character and correlation with other records, it is absolutely essential that the recording instruments do not continue to oscillate after the actual earth tremor has ceased. This is particularly true in reflection work. In this type of work, the slow ground wave has a particularly unpleasant affinity, as far as time of arrival is concerned, with the reflected waves. It is therefore necessary to overemphasize the magnitude of the reflected wave as compared to the ground wave by selectivity in the recording instruments, and to identify the reflected wave by character. This is sometimes difficult, to say the least ,and various recording distances must be used to find the distance which brings in the best reflected wave, separated by as great a time interval as possible from this parasitic ground wave. Unless the instruments are thoroughly damped the ground wave will continue and be superimposed on the reflected wave, making it almost impossible to identify the latter. For this reason mechanical instruments are unsuited for reflection work.

The only means of damping mechanical instruments is in the pendulum system. This system may be damped by air, oil, or electro-magnetically. The latter method is to be preferred. In electrical instruments, the detector may be damped in a manner similar to the pendulum and the oscillograph may be damped by any of the above methods. All are satisfactory, if correctly used. Due to the possibility of the double system of damping in the electrical instrument, it may be damped easier and more satisfactorily than the mechanical instrument.

VIII. Although the seismograph records the seismic wave originating at the shot point, the data that is determined from the record is the time required for this wave to traverse a certain path. Therefore, the practicability of the seismograph is entirely dependent on the accuracy of the system used to determine this time element. The time of arrival of the seismic waves is usually determined to within one one-hundredth part of a second and in profile and reflection work to as small an interval as one one-thousandth part of a second or less.

There are several methods of obtaining this calibration of the speed of the film through the camera. A small pendulum may be so arranged as to interrupt a beam of light passing to the film, once each cycle. This results in a series of dashes along the length of the film. If the pendulum is designed so as to oscillate at a reasonably constant frequency, and the period is known or determined, the time intervals on the record may be determined with fair accuracy. Since this pendulum continues in oscillation only until it is damped out by the air and friction, it is quite possible for it to stop oscillation before the end of the record. This is frequently the case in very long shots so necessary in exploration for deep seated salt domes in the Gulf Coast. The periods of such pendulums are usually too large for accurate profile work.

Another method that is used in reconnaissance work in the Gulf Coast is to attach a small mirror to the escapement of a good clock. The main drawback to this method is that the periods recorded on the film are usually too great for the accuracy required in profile work.

The most accepted method is to use an electrically driven tuning fork. A well designed fork will maintain a frequency within the limits of the desired accuracy for long periods. The frequency of the fork may be applied to the film in a variety of ways. A galvanometer may be incorporated into the fork circuit and photograph a sine wave on the film. Pieces of metal containing slots may be fastened to the tines of the fork and so adjusted that these slots are perpendicular to the motion of the tines and in line with a beam of light directed on the film once in each cycle. Another adjustment puts two lines on the film per cycle. Still another adaptation and one that has proved particularly desirable lies in the use of a syncronous motor, driven by the fork. This motor carries a slotted wheel through which light passes at certain phases of each revolution. This has the distinct advantage of enabling the use of a distinguishing mark on one of the slots so that tenths, halfs or full seconds are marked off distinctly on the records eliminating the necessity of counting each time mark on the record. Forks used usually have a frequency of fifty cycles or a multiple of fifty. In reconnaissance work, the time lines may be separated by fiftieths of a second or even by tenths, although the latter interval is not considered good practice. In profile work, however, the timing interval should be not greater than one one-hundredth and perhaps less.

It must be kept in mind that this timing system is to be used in field work and not under laboratory conditions. The design of equipment that will record small time intervals under laboratory conditions is a relatively simple matter. However, when the instrument is to be subjected to severe shocks, moisture, only partially satisfactory power supply, and other deleterious conditions, a more careful design is necessary. If a synchronous motor is included as part of the equipment, it must be so designed as to be a truly synchronous motor. While an induction motor, operating at synchronous speed, will apparently meet the conditions, it will occasionally drop out of synchronism and as a consequence cause serious errors in the calculation of the data. Such errors are frequently difficult to detect and may necessitate the repetition of numerous records.

An excellent method of calibrating timing systems used on seismograph equipment, is as follows: Procure a radio receiver, capable of tuning in on the Naval Radio Station at Arlington, Va., or some broadcasting stations which makes a practice of rebroadcasting the government time signals at noon and 10 p.m. E.S.T. This signal is modulated CW and consists of dots every second except for certain definite omissions at the half minute and full minute intervals. Tune the timing signals in strong enough to record on the oscillograph equipment used to record the time of firing the shot. When these signals are tuned in and recording definitely on the camera, start the film in motion at the characteristic signal given at the beginning of each minute and let it run for a period of time not less than thirty seconds and preferably one minute if possible. These time signals are controlled by the master clock at the Naval Observatory at Washington, and are as accurate as it is humanly possible to make them. The number of cycles of the timing equipment, recorded in the one-minute interval of the radio time signals will give an excellent calibration of the timer constant.

IX. A very important factor in design is the simplicity of adjustment and operation of equipment. Due to the expense of seismograph exploration work, it is necessary to economize wherever possible. It would be better if one could have college men, preferably with several years of laboratory and field experience, to operate the instruments. It is rather difficult to get such men and still more difficult to hold them unless excellent salaries are paid them and opportunities for advancement offered. It therefore becomes necessary, to employ as instrument operators or observers, men who have had some college work perhaps, but little or no experience. It will also be necessary to replace them from time to time. As a consequence, it is more practical to have the instrument so designed that a bright young man with a high school education or better, can, with a few hours coaching and practice, operate the instruments in a satisfactory manner. It is also preferable to fix a standard design and build all instruments in accordance with this design. If modifications are desired, install such modifications on all equipment. This standardization of equipment, makes it a very simple matter to shift a man from one instrument to another or even from one crew to another without the necessity of his unlearning all he has learned and beginning all over.

All controls should be clearly labeled, and located in a convenient place. The control that is expected to be used once in six months and which therefore is hidden in an out of the way place, is frequently the control that is needed most, and the difficult location will frequently cause the loss of hundreds of dollars in delay to the whole crew.

Radio equipment should be so designed as to have the wiring easily accessable for resoldering joints that may become defective. Tubes, resistances, condensers and transformers that frequently cause trouble should be readily accessable for repairs. This also applies to the amplifiers, which are more important than the radios.

All equipment should be designed to be reasonably moisture proof. It is not necessary that it be air tight if correctly designed and constructed of first class materials. It is poor practice to fasten covers and doors with a multiplicity of screws. Considerable experience in the field has demonstrated to the author the results of such design. After the lids have been removed for the fourth time, half the screws are lost, and it is merely

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a question of time until they are fastened on with a screw in each corner. It is more practical to hinge the covers and doors, and fasten them with one or two easily operated catches. While this may not appear as satisfactory as screws when the instrument leaves the laboratory, it is decidedly advantageous in the field. In the electrical seismographs, the oscillographs perhaps, require most attention and adjustment. It is therefore advisable to provide extremely accessable adjustments on these instruments. They should be so mounted as to be replaceable in the field in a minimum of time. Suitable provisions for rapid adjustment of the mirrors should also be included under this heading.

In designing the instruments, the design of the automotive equipment and method of mounting in this equipment should be kept in mind. For a door in the back of a camera, while very useful when the camera is on an open table, is worthless when the instrument is mounted firmly against the wall of a truck or car. It is not advisable to have a number of wires fastened to the front of the equipment. There is always the possibility of the observers pulling one off at a critical time by accident. Such an accident may easily result in a loss of as much as one hundred dollars, due to the missing of a record. At the same time, cables and wires which must be frequently connected and disconnected, must not be made difficultly accessable.

The camera must be adaptable to rapid daylight loading. It is preferable to have separate light-tight magazines for both exposed and unexposed film. Spare magazines, which may be carried loaded with film should be provided. The design of the camera is worth considerable study, for on its efficient operation, the success of the entire equipment depends. A film which is light struck at a crtical spot is not only worthless but dangerous, because the computer or seismologist may, for economy's sake try to use it to his sorrow.

X. Any seismograph will record the sound wave which travels through the air and which is frequently used in the determination of the length of the shot. Some seismographs are more sensitive than others in this respect, and it is more or less true that the more satisfactory the instruments are for recording the seismic waves the less satisfactory they are for recording the air waves. It is therefore common practice to provide an auxiliary instrument for the recording of this air wave. This air wave recorder, according to its design, may or may not use amplifiers. The output of this device, frequently termed "Blastophone," is usually applied to the oscillograph used to record the radio signal of the instant the shot is fired. The two instruments may be connected into the oscillograph permanently, or the oscillograph may be changed from one to the other by throwing a conveniently located switch. The latter is preferable.

This air wave detector must meet very rigid specifications. It must be particularly sentitive to the peculiar type of waves set up in the atmosphere, which are frequently inaudible. At the same time it must not be sensitive to voice or noise frequencies, wind or shock. It is usual practice to have this instrument mounted permanently in the truck. Although the requirements of this instrument may seem impossible of attainment, satisfactory designs have been built along well known physical laws.

XI. As outlined under IX, all component parts should be readily accessible for repairs or replacement. It is pertinent to say a few words relative to replacement parts that should be included in the equipment. A spare for those parts most liable to cause trouble should always be carried in the field. This would include such items as vacuum tubes, oscillograph elements, detectors, film magazines, photographic chemicals, camera lamps and perhaps an extra fully charged storage battery. Other parts which may be expected to develop trouble or require replacement less frequently should be kept on hand at party headquarters. It is advisable to have a complete instrument with all the usual accessories on hand at the main office for use in case of severe damage to any of the instruments in actual service. Such damage may be experienced due to an automobile wreck, fire, or other unavoidable accidents or misfortunes. It is also necessary to carry a complete stock of any special equipment that can not be obtained on short notice from the manufacturers or built in the laboratory in a minimum of time.

XII. The question of development of records in the field is subject to considerable argument both pro and con. In geophysical exploration work, particularly when the territory being explored is not already under lease, it is essential that no information relative to the results of the work become public. Some companies take the attitude that if the record is turned in to the party chief before it is developed, there is no possibility of the data becoming general information among the crew. This is a valid argument but it is carried to an extreme. The observers have insufficient time in the normal days work to calculate the records after they are developed. And even if they did know the time of arrival of the various waves, it is necessary to consider the records for a given area as a whole as well as individually in order to correlate them and arrive at a correct analysis. It is therefore improbable that any information of value will leak out in this manner. The advantages of development in the field more than offsets the disadvantages in the opinion of the author. Observers may be trained to recognize the difference between an unsatisfactory record and a good record. Especially with regard to such points as disturbances due to extaneous causes before the seismic wave arrives, bad radio time break, unsatisfactory air wave, and insufficient amplitude on the seismic impulse. Although the observer can obtain some idea of the quality of the record by observing the movement of the spots on the film, he cannot ordinarily distinguish the amplitude of the first seismic wave to be recorded. He may report off scale amplitude on the first impulse that his eye records, and on development of the record find that this great amplitude was obtained for the ground wave that arrived as a later event, and that the wave transmitted by the deeper strata, which is of first importance, was of such a low amplitude as to be unreliable. If the record is not developed immediately after the shot, but is kept until the days work is finished, he will report this record as satisfactory and move to the next location. In an area where there is a marked difference in the absorption constants of the various strata, this may result in a very large percentage of unusable records for the days work. This will necessitate repetition of all bad records at a considerable expense. If the records are developed in the field, each observer will notice this condition of absorption, and if his record is in his opinion, unsatisfactory, he will report to the chief observer who will advise him to remain on location and repeat the record, and the chief observer will give instructions to the shot crew to increase the charge for succeeding shots. Such an arrangement results in a smaller percentage of unsatisfactory records, and in addition allows the use of a minimum of dynamite for satisfactory results.

There are three methods that will prove satisfactory for development of records in the field. The tent used with the mechanical instruments may serve as a dark room if it is truly light tight and well dirted down. An added precaution is obtained by the use of narrow mouth opaque jars for the development process. With electrical equipment where a tent is not part of the regular equipment, a small dark room may be built into the truck body. Both of these systems are practical but are decidedly uncomfortable, especially during the summer months.

A substitute for the dark room may be used, and development carried out by timing the process. Equipment similar to the tank development equipment sold by Eastman Kodak Company, may prove satisfactory in many cases. The objection to this system is in the relatively long time required for complete development and fixing. The most satisfactory system for rapid development in the field is herewith described. This method is being used very widely. Four jars, of about three pints to two quarts capacity, fitted with leak proof covers are mounted in a square box. A light proof hood, with an elastic or spring sewed into the seam is fitted so as to slip over the top of the box, being held in place by the spring. This hood tapers into a long sleeve which fits around the arm of the observer. The magazine containing the film to be developed is placed on top of the box and the hood is slipped over the box. The observer slips one arm inside the sleeve and pulls the film out of the magazine, which he holds from the outside with the other hand. Development is timed and usually takes about two to five minutes according to the concentration and temperature of the solution. After sufficient time has been allowed for complete development, the film is passed through the second jar containing wash water and placed in jar three which contains the fixing solution. As soon as the film is thoroughly immersed in the fixing bath the hood may be removed, and by the time the empty magazine is re-

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placed in the camera, it may be taken out of the solution and examined. After examination it is washed in the fourth jar and pinned to some form of drying rack. The observer may then pack up his equipment preparatory to moving. With this type of development equipment, not more than six minutes will be lost in the development process and the net results are an increased efficiency and consequent lowering of the cost per acre of the exploration work.

XIII. There are two methods in common use for recording the time of firing of the shot on the film. One is by means of wires strung from the shot point to the recorder, the other by radio. The first method is somewhat impractical for reconnaissance work due to the labor and delays in stringing several miles of wire between stations. If sufficiently sensitive recording instruments are used, a single fine wire with the return circuit completed through the ground may be used. However, difficulties are frequently experienced with this arrangement due to the breaking of the light wire.

The method that has proved most satisfactory is in the application of the short wave radio. Low power radio transmitters and receivers, operated from storage batteries, with plate supply furnished either by dynamotors or dry "B" batteries are used at both the shot point and the recording stations. These radios are used for communication either by voice or radio code, and the transmitter at the shot point is also provided with means for transmitting the instant the shot is fired to the receivers at the recording end. This is usually done by having the shot break the plate circuit of the transmitter when it is fired. The signal sent out from the shot point is picked up and amplified in the receiver and applied to some type of oscillograph incorporated in the camera. This oscillograph records on the film, the exact instant the shot is fired. Assuming that no relays having possible time lags are incorporated in the equipment, this signal is accurate to a greater degree than other data obtained.

Special consideration must be given in designing this part of the equipment. Relays are to be avoided due to possible time lags, which may vary from shot to shot. The radio set must, for safety's sake, be set up from several hundred to one thousand feet from the shot point. The method of wiring the shot so that it will open the transmitter circuit must be so designed that it will not alter the frequency of the transmitter, nor seriously reduce its output. There must also be no possibility of accidentally firing the shot while making these connections.

XIV. Since rapid and efficient operation of the party in the field is dependent on the correct functioning of the radio sets used, this part of the equipment must not be slighted in the least degree. Low power transmitters and very sensitive receivers are to be preferred. It is more satisfactory if these units are incorporated in one cabinet, although this complicates the design somewhat.

Since higher power in the transmitters increase the weight of the equipment to a considerable extent, it is absolutely essential that a minimum of power for satisfactory service be used. The usual power used varies from 5 to 30 watts The requirements of the radios are simple but very important. They must be capable of consistent daylight communication over distances not exceeding 15 miles. They must be stable and not inclined to shift wave or power output. Their adjustment must be simple and it is very advantageous to have a wavemeter incorporated in the design. Since it is necessary for two or more stations to be in communication with each other at the same time, it is desirable to have all transmitters operate on the same frequency. It is preferable to use non-oscillating receivers, and therefore the transmitters must use a modulated wave. This modulation may be accomplished by high frequency buzzer, tuning fork, or by use of an audio oscillator. The latter system is to be preferred. The receivers must be stable, sensitive, simple to operate, and not too selective. A sufficient number of electrical meters for determining the normal operation of the transmitter is essential. A quick change over switch is very convenient and facilitates speedy operation in the field. The cabinets must be so designed as to be easily accessable for changing tubes, etc., and for repairs and replacement of component parts. Sockets must be of such design as to preclude the possibility of tubes jumping from the sockets during transportation. Fully half the delays experienced by seismograph parties may ordinarily be laid to radio troubles of one type or another.

XV. Since seismograph equipment is to be used in the field under trying conditions, the design of the power supply for the equipment is worthy of considerable thought. It is preferable to design the equipment to fit the power supply available rather than provide a power supply to fit the equipment. storage and dry batteries are not only heavy, but expensive. While the question of expense is relatively unimportant in so much as it is a very small percentage of the total cost of field operation, weight must be kept at a minimum. It is perfectly feasable to build equipment which will require only one 12-volt storage battery and the necessary number of small "B" batteries for plate supply to the radio receiver and the seismograph amplifier. It is frequently considered impossible to operate the filaments of radio transmitters and receivers from the same power supply as the filaments of the amplifier. However, if suitably designed chokes are incorporated in these units no trouble will be experienced through interaction. It is however highly desirable to use separate plate supplies for these instruments. The plate supply for the transmitter may be supplied by a small dynamotor, operating from the storage battery.

XVI. The time required to set up and adjust instruments preparatory to taking a record will depend on the ability of the operator, as well as on the design of the equipment. An exceptionally efficient observer can get a mechanical seismograph in readiness in a minimum time of about 15 minutes. The usual time required will average better than 20 minutes. With a very carefully designed electrical seismograph, it is possible to make all preparations for the record in a much shorter time. With mechanical instruments from three to eight records may be taken per day. With electrical instruments, as many as 20 shots may be made under excellent conditions. The average for various designs of equipment varies from eight to twelve.

In summarizing, we may say that the electrical recording seismograph offers many advantages over the mechanical type of instrument. It is however true that more factors can be studied with the mechanical instrument and that while it is not so practical for routine commercial exploration work it is well adapted for pure research work.

If the full value of the electrical instrument is to be realized, a much more careful design is required than for the mechanical type. This is evident when one realizes that the characteristics of this type of instruments may be controlled in a variety of ways, and for a correct design, not only must each component part be correctly designed, but these component parts must also be designed relative to each other. In other words, it is of little value if the detector is designed to be most sensitive to the particular frequencies desired to be recorded, if the amplifier or the oscillograph is relatively insensitive to these frequencies.

The design of auxiliary equipment, such as the radio, timing system, and air wave recorder is independent of the design of the seismograph proper and as a consequence requires the same amount of care regardless of the type of seismograph which is to be used.

The usefulness of the seismograph in prospecting for petroleum producing structures, is dependent on three factors: 1. A satisfactory design of instrument; 2. Efficient use of these instruments in the field; 3. Correct application of theory in laying out work and in analyzing data obtained. Of these the first is by far the most important. A good party chief can succeed in obtaining efficient operation in the field. If he has sufficient intelligence and training, along with an ability to connect the abstract data obtained from the records, with certain geological conditions that may be expected, to exist in the areas explored, he will with sufficient experience, develop a satisfactory technique of analysis. However, if he has unsatisfactory instruments, he cannot obtain the necessary data, and as a consequence is very seriously handicapped in his endeavors to ascertain the conditions existing in the strata thousands of feet below the surface of the earth.

With increasing experience and further development of instruments and technique of operation, new theories will be evolved and more difficult problems will be solved by the application of this method of geophysical exploration. It is quite probable, that in the near future, areas which are now considered as offering unsurmountable difficulties, will be satisfactorily and rapidly worked by means of special types of seismograph equipment and improved technique of operations and analysis. The study of character in the seismic waves

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THE OIL WEEKLY, FEB. 8th, 1929.

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In Action **Records** Oil Fields

"From The Oil Weekly, February the 8th, 1929"

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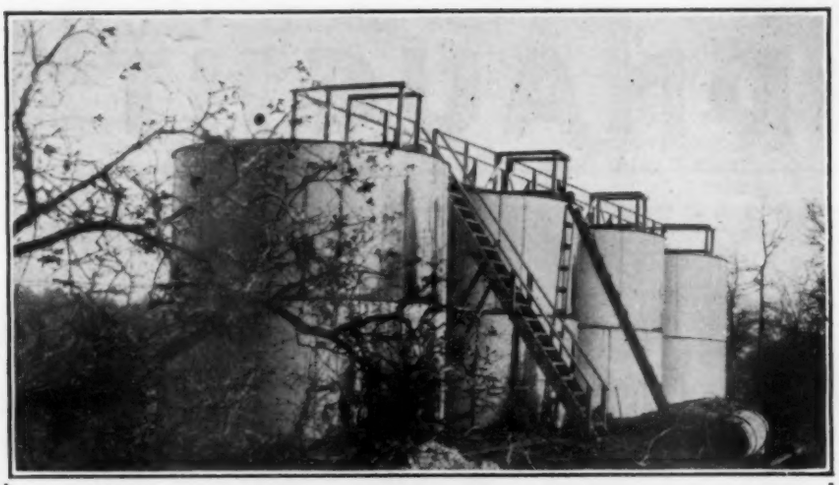

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recorded, is a forward step and may prove of particular value when more is known regarding this phase of the subject.

A few years ago, the use of reflected waves, which seemed so simple in theory, was considered impossible of attainment. At the present time, with refinements of instruments and newly developed technique of field operations and analysis of data, exploration work by means of reflected waves is being carried on efficiently in many localities.

It is worthwhile to say a few words regarding the various geologic conditions under which favorable data may be obtained by this instrument in its present stage of development. Structures of the salt dome type so common to the Gulf Coastal regions of Texas and Louisiana as well as other parts of the world, offer an interesting though simple problem. These structures, composed of a homogeneous plug of rock salt covered with a massive cap of anhydrite and limestone, intrude from great depths into unconsolidated Tertiary clays and sands. They therefore offer greatly exaggerated differences in physical properties and may be very effectivly located by the seismograph.

With a different technique of operation and analysis, excellent data on faults and anticlines may be obtained. These structures, as well as the salt dome structure, may be profiled with a reasonable degree of accuracy, provided the structure is not too deep nor too small. The depth and slopes of the flanks may also be determined on anticlinal structures. Faults may not only be located with reasonable accuracy, but the depth of the faulted strata as well as the throw and in some instances an approximation of the angle of Hades may also be determined. Data on these structures may be obtained by the application of the refracted seismic wave. Normal slopes of various strata may also be measured both rapidly and efficiently.

While the seismograph is capable of procuring valuable data on these various structures, it is pertinent to state that there are conditions under which it may not be successfully applied without an excessive cost. A study of the sub-surface strata is rendered much more difficult where the stratum to be explored is overlaid by other strata having a higher velocity of wave propagation. It is possible to work under such unfavorable conditions however if the instruments are so designed as to make it practical to pick later events on the records. The data obtained will naturally be less accurate under such conditions.

Another serious impediment to the successful application of the seismograph in certain areas is encountered when the strata to be explored is broken up by numerous small faults and cracks. In some instances, it is possible to work deeper strata in spite of this condition but such work is very difficult and the data obtained must be considered only as a fair approximation.

Many of the difficulties encountered in seismograph exploration by means of refracted waves are overcome by the application of reflected waves to the problem. It is frequently quite possible to obtain reliable data from strata overlaid by high-

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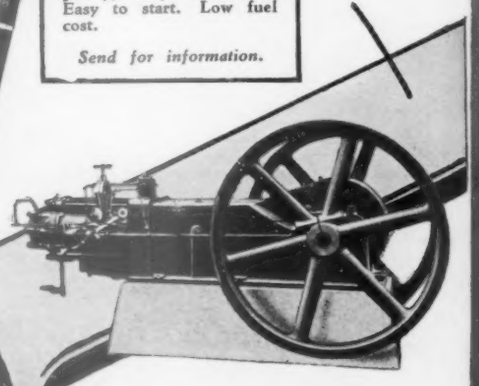

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er velocity strata by this method. It is also sometimes possible to get some idea of the structural conditions in areas where the strata is broken up to a considerable extent. It must be understood however, that although the successful application of the reflection principle is a forward step in the more general application of the seismic method under all conditions, it is not a cure all, and there are many localities where the strata desired to be explored does not have a surface that will reflect these seismic waves in a satisfactory manner. A combination of the two basic methods of seismic exploration will however prove successful under widely varying geological conditions.

The question is often raised regarding the depth to which seismic explorations can be carried on. This is entirely dependent on the conditions encountered in the areas worked. In the Gulf Coast, definite indications of the presence of salt domes appromixately 4000 feet below the surface have been obtained. On several of these structures the data has been checked by the drill. Under favorable conditions it is quite possible to record from still greater depths, while under less favorable conditions, less reliable data may be expected at shallower depths.

Depths reported by seismic explorations are usually relative. Due to the necessity of making assumptions that are not strictly correct, computed depths are usually excessive unless empirical correction factors are applied. These correction factors are unnecessary in reconnaissance work but are increasingly more important in detail or profile work. Empirical correction factors may be determined by correlating the seismic data with accurate well logs in the same area or by a special technique of reflection work. This latter will not prove successful under all conditions.

When it is considered that thousands of acres may be explored by seismic methods at a cost considerably less than is entailed in the drilling of one wildcat well, and when the ratio of the successes and failures of surface geology and wildcat drilling is taken into account, the seismograph becomes not only an accurate instrument but an economical instrument as well.

Tulsa.—Efforts are being made to introduce a gross production tax on oil in Kansas. One bill, already introduced would place this tax at three cents a barrel, this tax to supplant all other taxes on crude oil.

Another measure, not yet introduced, but contemplated would assess the gross production tax on a percentage basis. Since the measure is not pending, this percentage is not publicly known.

The opinion within the industry is that the bill now pending will not have favorable action. The provision of fixing the tax on a per barrel basis would impose a higher tax than prevails in Oklahoma, where the rate is three per cent.

The course of the measure, drawn but not introduced, can not be contemplated. The present Kansas legislature has gained the distinction of a "tax legislature." It happens that oil in the crude form is just one of many measures proposed as a method of boosting the state's revenue.

Parkersburg

HAS SERVED THE OIL FIELDS OF THE WORLD FOR THIRTY-ONE YEARS

Aluminum Paint for Steel

PAINT is primarily used for protection—to protect the surface against the elements. To what extent, and how long this protection is assured, depends upon the quality of the paint.

After an exhaustive research Parkersburg standardized on Aluminum Paint. In actual tests, this paint proved to be a better oil field paint, and to give better protection than any other paint. It provides a flake coating of Aluminum Metal together with a coating of paint.

The outstanding advantages of Aluminum Paint are—its ability to minimize evaporation by reflecting the sun's heat, instead of absorbing the heat rays, and the superior protection it offers against corrosion of metal surfaces.

Parkersburg Aluminum Painted All Steel Derricks, Tanks and other Steel Equipment, are protected against the elements by this coat of *Metallic Aluminum*, a protection that adds years to the life of the equipment, lowers derrick depreciation, reduces oil evaporation and checks deterioration.

When you buy Parkersburg Aluminum Painted Steel Equipment, you buy products that are manufactured on a quality basis and protected by the latest coating process developed for combating rust and corrosion—Aluminum Paint.

Aluminum paint is opaque and has a high reflectivity for light. Because of this the temperature of the paint, and of the material underneath, remains substantially lower than would be the case with other paints.

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Steel Derricks & Steel Crown Blocks	Rig Irons (API Standard)
Chain Drives	Portable Drilling Machines (Wood & All-Steel)
Sand Reels & Bailing Lines	
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All-Steel Standard Rigs	Miscellaneous Drilling Equipment

Check the equipment in which you are interested, tear out and return this page, with your name and address, to us, and we will send you complete information on the items checked.

The PARKERSBURG RIG & REEL COMPANY

Executive Offices & Main Plant, Parkersburg, W. Va., U. S. A.

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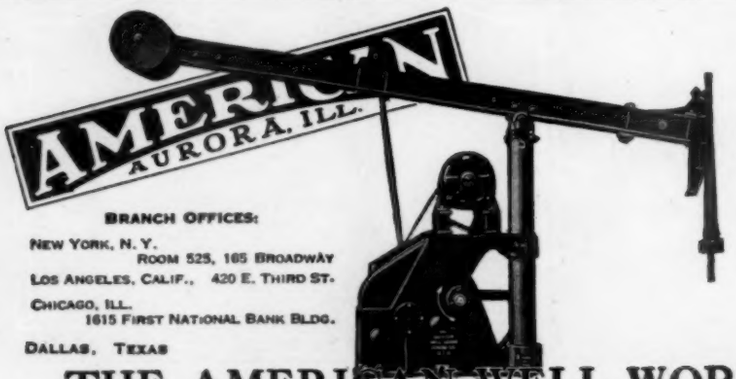

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THE AMERICAN WELL WORKS
General Offices AURORA, ILLINOIS and Factory

Kettleman Hills High Gravity Producer Was Interesting Development

(Continued from page 27)

ous, while those producing asphalt oil (original source) fall in the diatomaceous foraminiferal shales of the Krayenhagen. Asphalt oil is the chief product of the district, which would include both Coalinga and Kettleman Hills. The oil accumulation is chiefly in the Temblor (formerly Vaqueros), the Santa Marguerita (?) and Jacalitos-Etchegoin formations. The Temblor is the chief producer of the district. Logs of various wells show about 4500 feet of Jacalitos-Etchegoin, 1800 feet of brown shale and 900 feet of Vaqueros, using the discovery well as a base.

Little is known of the south dome, while the middle dome has had only a few tests. The discovery well is located on the north dome, on which most development has taken place. Either the middle or south dome may or may not be productive, while one may produce and the other prove valueless.

Oil from the Kettleman Hills is so light that the base is difficult to define. It contains both paraffin and asphalt in small quantities. An analysis follows:

Gravity (Baume)	60.6
Gasoline, 437° F.E.P.	88.0%
Distillation	00.5%
Residue	2.5%
I. B. P.	72°
10% over at	203°
30% over at	228°
40% over at	256°
50% over at	270°
60% over at	295°
70% over at	330°
80% over at	376°
90% over at	470°
97% over at	560°

Possible Market Influence

Two trunk pipe lines run within 35 miles of the field. A six-inch line has been built to carry production already developed, and more have been planned. A pipe line to Coalinga is being considered to provide an outlet via tank car.

Milham Exploration Company is pumping oil from the discovery well with waste gas. With a well pressure of 1250 pounds, only a small amount of gas is required. Special oil is used to prevent the pumps from freezing. The expansion of the gas upon leaving the well causes a temperature far below zero.

Effect of the discovery of the field on California may be far-reaching, promising to throw the center of production to this district. A production of 100,000 barrels is easily equivalent in value to a production of 300,000 barrels in other California fields. With a gasoline content of 88 per cent., the oil needs little refining to render it pure gasoline. It burns freely as fuel in motor cars when taken from the well and is nearly water white in color.

Kettleman Hills is regarded by San Francisco as vitally connected with its

GULF
MARLAND OILS
KERO TEST
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TYDOL
KEEPS
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COMPANY
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Cheaper Wildcats with Sullivans

20% less for operation **23% less for equipment**

39% less weight to be transported

A major oil company has just completed two wildcats in Venezuela with a Sullivan Diamond Drill.

One hole went to 4350 feet in five months and nine days. In the other, 4005 feet of 6⅝-inch casing was set and cemented one month and twenty-six days after spudding in.

Continuous core was recovered wherever desired.

The engineer in charge worked up complete figures on the diamond drill, and on a rotary outfit, for casing a hole to 6000 feet, and drilling it to 7000 (diamond drills have taken core from below 6700 feet).

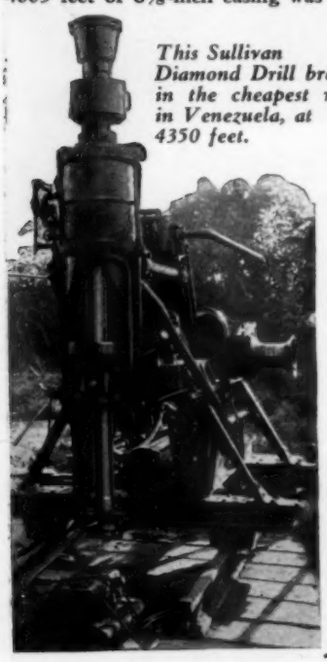
His figures show that the Sullivan Equipment weighs only 61% and costs only 77% as much as the rotary outfit.

He says also that his experience shows the cost of operation, to run 20% less than for other rigs—due to savings in labor, fuel, water, rigging up, bits, and other items.

For cheaper wildcatting, for deep tests, or for structure exploration use Sullivan Diamond Drills. They will drill any formation as encountered, go to any depth, and furnish perfect core wherever desired.

The coupon will bring complete information.

This Sullivan Diamond Drill brought in the cheapest wildcat in Venezuela, at 4350 feet.



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SULLIVAN MACHINERY COMPANY
419 Peoples Gas Bldg., Chicago

growth. A 22-inch gas line is under construction from the field to this and other San Francisco bay cities and a supply of natural gas is assured for years. The line will be 240 miles long and will carry as high as 150 million cubic feet of gas daily.

Development Preparations

Actual development of the field is under way. Operating companies did not rush into the district overnight, as in the case of townlot drilling campaign. It was necessary to build roads, lay pipe lines, build electric lines and establish large camps. The nature of drilling made it necessary to make ample preparations before starting operations. More than 500 men are engaged in preparations for a prolonged drilling campaign. One company has set aside several million dollars for the ensuing year. About 25 wells are drilling. It will require from six months to 18 months to finish wells in the field, according to company estimates. The estimated cost per well is from $200,000 to $300,000, depending upon conditions.

Steam power was used before the discovery well blew in, but electric power will be used on the majority of future wells. Scarcity of water has hampered operations for years, but electricity is expected to relieve the shortage.

In Kettleman Hills, California seems to have a field which may have a tremendous influence on production all over the world.

Educational Picture Tells Story of Mexican Fields

"Through the Oil Fields of Mexico" is a new educational motion picture film prepared by the Department of Commerce and released for distribution. The film visualizes drilling of oil wells in the Mexican jungles and depicts the various stages in the transportation, storage, and refining of petroleum in Mexico. Location of the principal Mexican oil fields is made plain by the use of specially-drawn maps.

The first scenes show the "Hill of Tar," where the seeping of oil through the surface first called attention to the petroleum possibilities of Mexico. Next follow scenes of the Cerro la Pez well, the first commercial oil well in Mexico, which attracted the pioneers of the industry.

Views are presented of the Cerro Azul camp on the site of one of the richest oil pools of history.

Other scenes show the famous Potrero del Llano No. 4 and the Dos Bocas wells. The first named well ran wild for nearly four months, much of the oil being saved by construction of a dam across a tropical river. Production from this wel lamounted to 110,000,00 0barrels. Rejuvenation of this well, long after it was considered exhausted and when its equipment was buried under masses of debris, is shown in a series of striking scenes.

One of the best bits of the film shows the actual bringing in of a great gusher.

COMPLETIONS FOR PAST WEEK IN U.S. FIELDS

KANSAS

Company, Well and Location	Initial Production Bbls.	Depth
COFFEY COUNTY—		
McCulloch Oil Co., Hutchins 1, sw se nw, 18-23-16e	*	1490
ELLIS COUNTY—		
Davis & Hazlet et al, Weiland 1, ne, 1-13-16w	250	3014
Empire & Derby, Kraus 1, nw sw sw, 17-14-19w	*	3881
GREENWOOD COUNTY—		
Mid-Continent, Geist 3, nw sw, 13-24-12e	30	1727
Peerless Oil & Refg. Co., Cannon 1, c ne nw, 8-26-13e	*	1600
Superior, Bonnet 5, nw sw ne, 13-24-12e	*	1793
HARVEY COUNTY—		
White Eagle & Hartman & Skaer, Miller 1, c se, 3-24-1e	*	3600
McPHERSON COUNTY—		
Amerada, Roseberg 1, sw se nw, 31-18-2w	¶2½ 200	2997
Gardner, Benson 2, ne sw, 32-18-2w	310	2986
ROOKS COUNTY—		
Phillips, Tatkonhorst (OWDD) 1, ne nw, 14-9-16w	*	3612
RUSSELL COUNTY—		
R. E. Day et al, Mermis 4, ne se ne, 32-13-15w	60	3329
Griffeth et al, Gorham 1, ne se se, 30-13-15w	*	3383
SEDGWICK COUNTY—		
Bu-Vi-Bar et al, Wright 2, ne se, 12-26-1w	1375	3383
Bu-Vi-Bar et al, Lyon 3, nw sw, 7-26-1e	1480	3354
Mason & Van Zandt, Jones 1, c nw sw, 19-25-1w	*	3504
Simmons & Canary, Haver 1, sw se, 9-26-1e	*	3671
SUMNER COUNTY—		
Tidal, Horton 1, se, 17-35-2e	¶3	3341

OKLAHOMA

Company, Well and Location	Initial Production Bbls.	Depth
BECKHAM COUNTY—		
Co-Operative Syndicate, Joyce 1, ne, 22-9n-23w	¶8¼	2817
Sayre O. & Refg. Co., Davis 1, sw nw, 24-9n-23w	¶28	2800
CARTER COUNTY—		
Humble Hitchcock 1, se sw nw ne, 12-4s-3e	*	1500
COMANCHE COUNTY—		
Turner & Long, Curtis 1, ne se, 25-2n-10w	*	430
CREEK COUNTY—		
William Sherry & Carter, Harmon 1, sw se ne, 28-19-9e	¶2	1366
Silurian, Starr 27, se nw ne ne, 17-18-7e	¶1¼	657
Magnolia, Coker 34, sw nw nw, 16-18-7e	20	2541
Magnolia, Vance 7, cwl sw ne, 7-19-7e	75	2490
Pure, Crow 3, cel ne ne, 5-18-7e	5	2644
C. G. Tibbens, Connisenny 39, ne se nw, 30-15-9e	10	1275
Winemiller Corp., Darrisaw 1, se sw, 34-19-9e	*	3017
Curtis, McIntosh 1, nw sw ne, 13-17-11e	*	2513
C. O. Buckles, Frank 1a, nw sw sw, 18-16-13e	*	2275
Wilcox & Oswalt, Anthis 8, csl nw sw, 1-16-11e	*	2379
HUGHES COUNTY—		
Independent, Jackson 1, c nw se, 11-7-8e	¶38	3033
Shaffer & Winona, Harner 1, sw ne, 20-7-8e	*	4382
KAY COUNTY—		
Comar Oil Co., Preboth 2, nw, 21-29-12	*	1270
MARSHALL COUNTY—		
Helman & Gill, Storey 1, sw nw, 3-5s-5e	*	700
McINTOSH COUNTY—		
J. E. Weible, Bruner 2, ne sw se sw, 25-11-16e	*	2057

SUMMARIZED REVIEW OF FIELD RESULTS

State—	Completions This Week	Completions Last Week	Producers This Week	Producers Last Week	Gas Wells This Week	Gas Wells Last Week	Failures This Week	Failures Last Week	Initial Production This Week	Initial Production Last Week
Arkansas	..	6	..	..	..	..	..	6	...	...
California	22	20	22	19	..	..	..	1	24,525	32,660
Illinois	4	2	2	1	..	..	2	1	12	2
Indiana	1	3	..	..	..	2	1	1	...	...
Kansas	17	6	7	5	1	..	9	1	3,705	395
Kentucky	22	26	14	21	..	4	8	1	710	572
Louisiana	7	11	2	4	..	2	5	5	1,700	1,355
Michigan	6	4	2	3	1	1	3	..	150	950
Ohio	35	45	7	15	17	14	11	16	127	206
Oklahoma	67	93	33	69	8	8	24	16	15,173	56,912
Pennsylvania	53	3	46	3	5	..	2	..	138	14
Texas	126	125	71	70	5	9	50	46	72,757	39,117
West Virginia	14	15	3	4	10	11	1	..	23	34
Total	374	359	211	214	47	57	116	94	119,020	132,217
Increase this week	15	..	..	..	..	..	20	..	...	...
Decrease this week	..	..	3	..	4	..	..	..	13,197	...

Company, Well and Location	Initial Production Bbls.	Depth
MUSKOGEE COUNTY—		
L. T. Haney, Linder 1, c se, 33-13-18e	*	2368
OKFUSKEE COUNTY—		
Minnehoma, Johnson 1, se nw, 34-11-11e	*	3841
Becker & Hutchinson, Berryhill 3, ne nw nw, 8-14-13e	*	2195
OKMULGEE COUNTY—		
J. L. Kirland & Son, Carr 1, se sw sw, 17-15-13e	20	1568
OSAGE COUNTY—		
Lewis Prod. Co. et al, No. 3, se ne se, 15-26-6e	420	3008
PAWNEE COUNTY—		
J. H. Markham, Jr., Reynolds 8, sw, 25-21-8e	10	1308
Peerless et al, Nobles 1, nw ne ne, 20-20-9e	¶4	2320
Magnolia, School Land 1, ne, 36-23-4e	*	4380
Edwards et al, Byers 1, se nw ne, 31-21-9e	*	1123
Peter Adamson, Jr., Thomas 3, ne se se nw, 25-21-8e	*	1115
POTTAWATOMIE COUNTY—		
Home Gas Co., Townsite 1, sw, 14-7-4e	470	4273
Darby, Youngblood 1, se nw, 16-7-4e	750	3865
Gypsy, LeClair 3, se sw se, 23-7-4e	285	4311
Sinclair, Bruno 1, (OWDD) cnl ne, 26-7-4e	450	4432
Texas, Calvin 5, sw se, 7-8-5e	710	4236
Tidal, Smith 1, nw sw se, 8-8-5e	415	4109
Pure, Lindley 6, nw sw se, 18-8-5e	440	4116
Sinclair, Bellars 8, sw ne ne, 19-8-5e	580	4195
Atlantic & Gypsy, Delaware 1, se ne ne, 13-9-4e	36	4233
SEMINOLE COUNTY—		
T. B. Slick, Wyetha 1, nw sw sw, 24-5-7e	85	4490
Louisiana, Reed 5, se ne ne, 18-5-8e	240	2625
Sunray, Cully 8, csl ne se ne, 18-5-8e	250	2588
Texas, Lucy 7, ne nw ne, 19-5-8e	500	2535
Gypsy, Mosar 2, ne se ne, 1-8-5e	385	4356
Shaffer, Weaver 1, ne, 12-8-5e	1250	4302
Twin State, Ripley 1, se ne, 12-8-5e	770	4462
Gypsy, Mission 2, se sw, 5-8-6e	85	4439
Gypsy, Barkus 5, nw sw, 6-8-6e	2110	4646
Gypsy, Mission 6, nw se se, 6-8-6e	800	4731
Gypsy, Mission 7, sw ne se, 6-8-6e	1710	4717
Gypsy, Barkus 2, sw nw, 7-8-6e	172	4485
Gypsy, Hardy 1, ne sw ne, 7-8-6e	210	4657
Shell & Papoose, Maines 4, nw sw sw, 7-8-6e	465	4167
Carter, Micco 2, ne nw nw, 8-8-6e	680	4633
Skelly, Mayes 4, nw se ne, 1-9-5e	220	4442
Shaffer, James 1, se nw, 15-9-7e	¶30	3558
Mid-Continent, Nevins 3, nw se se, 32-10-6e	430	4394
W. B. Pine, Micco 1, nw ne nw, 8-8-6e	*	4442
Gypsy, Sango 16, ne sw ne, 1-9-5e	*	4360
Shaffer, McCoy 2, nw sw sw, 36-10-5e	*	4470

Company, Well and Location	Initial Production Bbls.	Depth
STEPHENS COUNTY—		
Magnolia, Green 1, sw ne, 13-1s-4w	¶8	2550
Lone Eagle, Simpson 7, ne sw ne se, 34-1s-8w	25	1840
Magnolia, Kagay 20, se sw se sw, 34-1s-8w	90	1644
Ridgeway et al, Regan 1, sw se se, 15-2s-6w	*	2508
Ilsing, Russell & Nance, Houston 1, ne sw sw, 21-1s-7w	*	2500
Conner et al, Worrell 1, csl n½ ne nw, 22-1s-8w	*	2250
TILLMAN COUNTY—		
Dixie, Harrison 1, ne, 29-3s-18w	*	3259
WAGONER COUNTY—		
Homer et al, Irving 1, nw se, 22-18-17e	*	885

CALIFORNIA

Company, Well and Location	Initial Production Bbls.	Depth
ATHENS-ROSECRANS—		
Barnsdall Oil Corp., O'Dea 8	700	5980
LONG BEACH—		
Chicksan Oil Co., Clarke 2	700	6200
Dabney-Johnson Oil Corp., No. 18	800	7007
No. 27	600	4790
D'Angelo Oil Co., No. 4	3400	3500
Italo Pet. Corp., Macrate 2	100	5930
Macmillan Pet. Corp., No. 8	200	4540
Shell Oil Co., Patton-Wilson 8	2500	6670
Rose 2	1100	7090
Warren and Macrate, Dugan 1	1700	6770
MIDWAY—		
Republic Pet. Co., No. 33, 8-32-23	1000	3000
Standard Oil Co., No. 15, 29-31-24	150	4520
No. 85, 19-31-24	125	4340
SANTA FE SPRINGS—		
General Pet. Corp., S. F. 207	2100	5855
George F. Getty, Inc., No. 10	800	5750
Standard Oil Co., Koontz 8	100	5780
S. W. Comm. 19	2250	5720
Star Pet. Co., No. 3	2100	5885
The Texas Co., Matern 3-10	100	4740
SEAL BEACH—		
Standard Oil Co., San Gabriel 8	2400	5490
San Gabriel 11	1500	5070
VENTURA—		
Pacific-Western Oil Co., Willett 4	100	7210

ARKANSAS

Company, Well and Location	Initial Production Bbls.	Depth
OUACHITA COUNTY—		
Chas. McDonald, Wilson 1, 25-15-18	305	2866
Shell Pet. Corp., Snyder 4, 34-15-15	40	1973
UNION COUNTY—		
Magnolia Pet. Co., W. K. Gregory 2, 15-17-14	35	2828
Ohio Oil Co., W. J. Raulston 1, 12-17-14	2069	3037
(24-hour gauge through 7/16-in choke)		

(Continued on page 100)

(Continued from page 99)

EASTERN STATES

PENNSYLVANIA

BRADFORD FIELD—

Company, Well and Location	Initial Production Bbls.	Depth
South Penn Oil Co., Bingham 405, tr 3	2	....
Bingham 151, tr 42	2	....
Bingham 395, tr 1	5	....
Bingham 533, tr 101	2	....
Bingham 533, tr 102	3	....
Bingham 533, tr 103	2	....
Bingham 400, tr 91	2	....
Bingham 400, tr 92	2	....
Bingham 398, tr 2	3	....
Bingham 190, tr 80	2	....
Bingham 190, tr 81	8	....
Bingham 439, tr 118	4	....
Ekas 3	2	....
Ekas 4	2	....
Ekas 5	2	....
Ekas 6	2	....
Ekas 7	2	....
Ekas 8	2	....
Ekas 9	2	....
Melvin A-018, A-019, A-020,..pressure		....
Melvin A-021	2	....
Melvin A-022, A-024, A-025..pressure		....
Whipple 30	3	....
Forest Oil Corp., Forest, eight (8) wells	16	....
Forest, seven (7) wells.....pressure		....
Dallas Oil Co., Dallas 3	5	....
Dallas 4	9	....
BUTLER COUNTY—		
E. H. Hutchinson & Co., Pepper 1..	¶1	....
Stewart & Blair, Stewart & Co. 5...	3	....
W. B. Sedwick, Sedwick 1	2	....
Boyer & Co., Twentler 2	*	....
T. W. Phillips O. & G. Co., Wolfe 1	2	....
Pollock & McKee, McKee 15	3	....
VENANGO COUNTY—		
S. R. Ramage, Jr., Henderson 49...	3	....
S. Y. Ramage, Jr., Stiles 74, tr 80..	¶¼	....
Stiles 74, tr 81	2	....
Fryburg Motor Co., McLaughlin 2..	¶¼	....
Bush 1	¶¼	....
C. Surrena, Surrena 24	3	....
Bob F. Whitling, Huff 17	2	....
A. M. Hulings, Best 4	*	....
CENTER-MIDDLE FIELD—		
Goal Oil Co., Goal 65	3	....
Wright & Gibson, Lot 10, tr 4	3	....
Henderson & Co., Bauer 1	2	....
Clarendon Prod. & Ref. Co., Lot 109, tr 23	2	....
CLARION COUNTY—		
Alum Rock Gas Co., Hess 1	15	....
Detwiller 3	4	....
Dempseytown Gas Co., Coldheep 1..	¶1	....
H. J. Crawford, Hess 16	3	....

NORTHWESTERN OHIO

ALLEN COUNTY—

H. F. Kelley & Co., Snider 2	25	1385
Neeley & Nolan, Bassett 3	30	....

INDIANA

GIBSON COUNTY—

Bement Gas Co., Bailey 1	*	1476

ILLINOIS

WABASH COUNTY—

Wabash Oil Co., Stillwell 8	10	1385
McColpin Bros. & Co., Kogan 2	*	1442
CLARK COUNTY—		
W. C. McBride, Inc., Connelly 3	2	540
LAWRENCE COUNTY—		
Ohio Oil Co., Hipshire 3	*	1657

MICHIGAN

MUSKEGON COUNTY—

Royal Pet. Co., Murphy 1	120	2084
Dixie Oil Co., Ross 1	30	1678
Swastika O. & G. Co., Berkema 1..	¶10	2044
Harper & Newman, Cook 1	*	2200
J. F. Carpenter & Co., Jensen 1	*	2285
Continental Motors Corp., Fee 10	*	1708

SOUTHEASTERN OHIO

MONROE COUNTY—

Ohio Fuel Gas Co., Blair 2.....¶1¼-20		1266
Fogle 1	¶¼	1995
James Whittenbrook, Weber 1	*	1423
MORGAN COUNTY—		
Ohio Fuel Gas Co., Ellis 1	¶ ¾	735
Hart 1	¶¾	1667
NOBLE COUNTY—		
John Yearing & Co., Lincicome 3	*	245

CENTRAL OHIO

PERRY COUNTY—

Squire Northern Dev. Co., Martin 4	*	3414
Abe Snyder & Co., Fleming 1	5	3732
F. D. Friend & Co., McClelland 1..	*	395
LICKING COUNTY—		
Wehrle O. & G. Co., Darnes 4	*	2703
Kreager 1	*	2862
Creston Oil Co., Ashcraft 3	2	655
SUMMITT COUNTY—		
East Ohio Gas Co., Brauchner 1...	¶2	....
Miller 4	¶1	....
Kertsez 1	¶1½	....
ATHENS COUNTY—		
Ohio Fuel Gas Co., Kasler 1	¶1¼	1367
Galloway 1	*	1016
Logan Gas Co., Baughman 1	*	....
GUERNSEY COUNTY—		
J. E. Patton & Co., Stone Hrs. 1 ..	*	3586
Lee & Moseley, Cable 1	10	3455
WAYNE COUNTY—		
Ohio Fuel Gas Co., Keyser 1	¶½	....
Somerside 1	¶1½	....
KNOX COUNTY—		
Ohio Fuel Gas Co., DeLong 3	¶1¾	....
I. E. O'Hail, Hipp 1	¶3	....
ASHLAND COUNTY—		
Kemrow Co., Miller 3	¶¾	....
Fawn Daw & Co., Brown 5	*	543
LORAIN COUNTY—		
Ohio Fuel Gas Co., Coghlin 1	¶2¼	....
Logan Gas Co., Rust 1	*	....
COSHOCTON COUNTY—		
William Stevens, Lake 2	¶¼-35	3233
BELMONT COUNTY—		
National Pet. Co., Hickenbottom 1	¶2	925
MEDINA COUNTY—		
Logan Gas Co., House 1	¶1½	....
JACKSON COUNTY—		
Ohio Fuel Gas Co., Radcliff 1	¶½	2612
MEIGS COUNTY—		
Coal Hollow O. & G. Co., Burdette 2	¶1	536
LAWRENCE COUNTY—		
Wittmer O. & G. Properties, Tr., Witrock 1	*	3870

WEST VIRGINIA

LINCOLN COUNTY—

Earl Cameron, Stone 3	¶½	....
J. Stone 1	¶½	....
L. R. Sweetland, Hilbert 2	¶¾	....
United Fuel Gas Co., Lincoln Land 3252	¶½	....
RITCHIE COUNTY—		
Hope Construction & Ref. Co., Wilson 1	*	....
Hope Natural Gas Co., Collins 1	10	....
BOONE COUNTY—		
W. G. McCorkle & Co., Covert 1...	¶1½	....
United Fuel Gas Co., Horse Creek Land 1894	¶½	....
JACKSON COUNTY—		
Heck Oil Co., Brown 2	10	....
WIRT COUNTY—		
Dailey Bros., Adams 1	3	....
ROANE COUNTY—		
United Fuel Gas Co., Keffer 2575 ..	¶1¼	....
KANAWHA COUNTY—		
United Fuel Gas Co., King Land Co. 2548	¶½	....
CALHOUN COUNTY—		
W. H. Bickle, Hayhurst 1	¶1½	....
GILMER COUNTY—		
United Fuel Gas Co., Brown-Goshorn 2534	¶½	....

KENTUCKY

OHIO COUNTY—

Hupp, Duff & Co., Bartlett 2	200	....
Bartlett 3	200	....
Snowden-McSweeney Co., Howard Hrs 12	60	455
New Domain O. & G. Co., Royal 4	30	....
Cumberland Pet. Co., Hamilton 15..	15	....
Leeper Oil Co., Evans 3	30	....
Ray Bigler & Co., Hendricks 7	*	874
Ohio Oil Co., Roach 8	*	675
DAVIESS COUNTY—		
Smith, Randolph & Co., Wells 9	30	....
L. C. Young & Co., Hayden 8	30	....
Yeiser 9	20	....
Ridgeway 1	*	....
D. J. White & Co., Howard 1	25	....
Daley & Lowman, Burton 4	5	....
Penn-Indiana Oil Co., First Nat. Bank 3	20	....
Eastern Gulf Oil Co., Murray 7	20	....
Cumberland & Kemrow Co., Easton 2	25	....
Creek Drilling Co., O'Flinn 1	*	1330
French & Co., Richardson 1	*	....
Goldburg, Young & Co., Riddle 2	*	....
Wood Oil Co., Inc., Lashbrook 1..	*	....
Leeper Oil Co., Schneider 1	*	1470

NORTH LOUISIANA

DE SOTO PARISH—

Magnolia Pet. Co., Fortsen 3, 4-12-11	¶2	748
CADDO PARISH—		
Dixie Oil Co., Huckaby 4, 11-21-15..	*	4037
MOREHOUSE PARISH—		
Nat. Gas Prods. Co., Crossett Lbr. Co. 23, 26-21-4e	¶10	2190
OUACHITA PARISH—		
Southern Carbon Co., Fairbanks 11, 33-20-4e	¶7.8	2140

SOUTH LOUISIANA

ANSE LA BUTTE—

Yount-Lee Oil Co., La. Pet. Co. 4	*	3750
BAYOU BOUILLON—		
Rycade, Atchafalaya Fee 3	*	5165
EVANGELINE—		
E. F. Simms Oil Co., Grace von Schueler 1	*	4550
HACKBERRY—		
Moon Oil Co., Sanner 2	900	3130
Federal Pet. Co., Kaough 1	800	3215
SULPHUR—		
Union Sulphur Co., Fee 739	*	3000

TEXAS

TEXAS GULF COAST

BATSON—

Paraffine Oil Co., Knight 45	6	845
BIG CREEK—		
The Texas Co., Wheat 4	*	3643
BOLING—		
The Texas Co., Dippel A-1	*	3985
CLAY CREEK—		
Sun Oil Co., G. F. Grote 6	1000	1225
CLEMENS DOME—		
Meyer et al, Davidson 2	*	950
GOOSE CREEK—		
Atlantic O. P. Co.'s Gallard 20, dd	50	2845
HULL—		
Gulf, Phoenix Dev. Co., 3, dd	160	2420
Republic Prod. Co., Dolbear 127, dd	300	1980
LONG POINT—		
Gulf, Wolf 14	*	650
LOST LAKE—		
Pure Oil Co., Lost Lake 2	*	4192
NORTH DAYTON—		
Sun Oil Co., Kovleika 1	*	4680
ORANGE—		
Sinclair O. & G. Co., Granger 4, dd	900	3600
RACCOON BEND—		
Humble, E. B. Wilson 3	*	1078
SOUTH LIBERTY—		
Sun Oil Co., Mitchell 39	500	1780
The Texas Co., Staiti 18	325	1655
Staiti 19	300	2270
Jefferson Oil Co., Turner 1	*	1060
Fort Bend Oil Co., Blanche Reviere 1	500	2230
Brownie-Babbette Oil Co., Turner 1	*	1222
SPINDLE TOP—		
Yount-Lee Oil Co., McFaddin 93	1140	2520
McFaddin 95	340	2500
Gladys City 82	1200	3075
STRATTON RIDGE—		
Empire G. & F. Co., Brock 2	*	3700
SUGARLAND—		
Humble, Camp 2	1500	3600
WEST COLUMBIA—		
Gulf, Tom Hogg et al 3, dd	200	3050

SOUTHWEST TEXAS

DUVAL COUNTY—

Magnolia, Hahl B-5, n end School-field-O'Byrne pool	1200	2342
WEBB COUNTY—		
O. W. Killam, Bruni 6, blk 4, sur 3, Arispe grant	¶35	2360
J. G. Mackay, Richardson 1, sur 5..	¶25	1775
W. F. Morgan, King-Harper 1-A, sur 323	¶15	1766
ZAPATA COUNTY—		
Killam-Duggan, Cuellar 4, Cerrito Blanco grant	*	2087

EAST TEXAS

PANOLA COUNTY—

Texas Co., Adams B-10, Co-Ord F-16	¶6	2672

(Continued on page 102)

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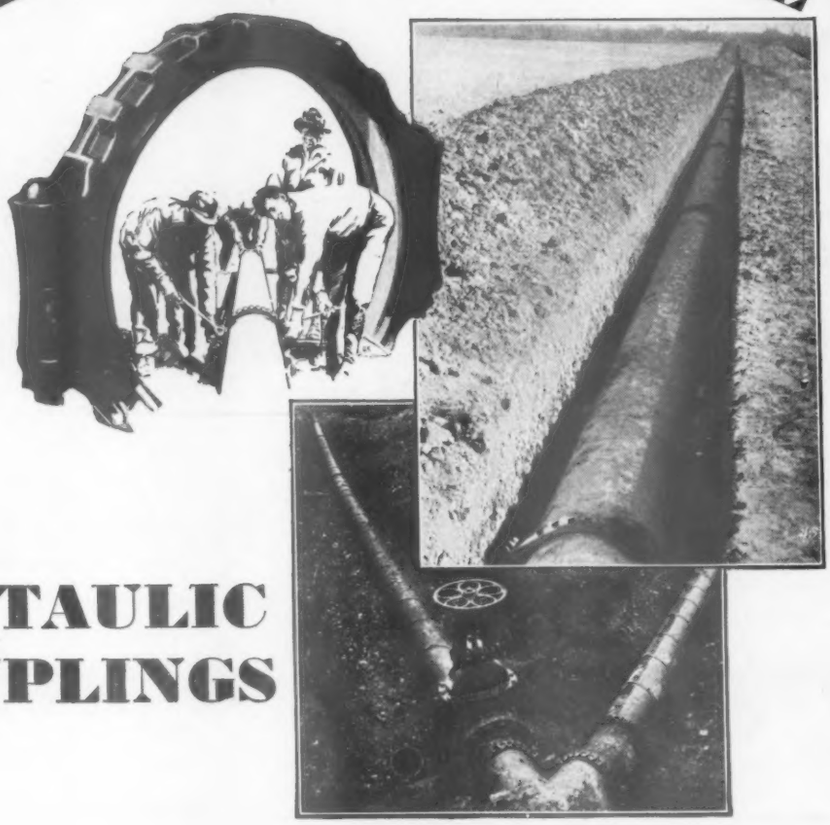

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(Continued from page 100)

Company, Well and Location	Initial Production Bbls.	Depth
LIMESTONE COUNTY—		
Riverland Oil Co., Hancock 1	*	2682
TEXAS PANHANDLE		
CARSON COUNTY—		
Marland Prod. Co., S. B. Burnett 1-L	†	755
Skelly Oil Co., H. Schafer 11	220	3175
GRAY COUNTY—		
Delmar Oil Co., A. Chapman 1	75	2852
Operators Oil Co., W. Jackson	¶15-2400	2845
The Texas Co., A. Chapman 5-A	340	2808
HUTCHINSON COUNTY—		
Phillips Pet. Co., Johnson-Florence 4	525	2914
NORTH TEXAS		
ARCHER COUNTY—		
Barkley-Meadows-Riner-Bailey, Wilson 1-C	30	1371
L. T. Burns et al, Turbeville 1-F	*	1600
Consolidated Oil Co., Maxwell 1	*	1504
Gulf Prod. Co., E. Alexander 3	18	1415
Fain-McGaha & Humble O&R Co., Logan 1-A	25	1137
P. J. Lea & Daniels, Williams 4	20	579
Magnolia Pet. Co., B. H. Wallace 1	*	1816
A. Llewellyn 1	*	2014
May-Camp Drlg. Co., Prideaux 3	10	579
Panhandle Ref. Co., Dowlen 1	*	1915
Petroleum Prod. Co. et al, Kunkel 1-A	40	1185
Underwood Drlg. Co. et al, Perkins 1	35	1623
BURKBURNETT—		
Magnolia Pet. Co., Hugh Reilly 141	25	1627
CLAY COUNTY—		
Bain-Clark et al, Landrum 8	*	700
Mid-Continent Holding Co., Stine 3	*	305
ELECTRA—		
W. H. Hammon et al, McCarty 1-E	25	1370
Ryan Consolidated Pet. Corp., Waggoner Bros. 1	†	1570
JACK COUNTY—		
General Oil Co., Simpson 1	*	2207
K-M-A AND IOWA PARK—		
John W. Caldwell et al, Allen-Kemp 11	45	1650
Allen-Kemp 12	35	1647
C. A. Evarts et al, Mrs. M. J. Powell 1	*	1420
J. A. Fisher et al, Fisher 1	7	310
Fisher 2	4	312
Fisher 3	5	311
Fisher 4	5	313
Fisher 5	4	312
Staley-Wynne & Co., K. & K. 7	25	854
MONTAGUE COUNTY—		
C. M. Beckner et al, Phillips 1	*	2015
The Texas Co., Gist 8-B	35	852
WILBARGER COUNTY—		
Fain-McGaha Oil Corp., Waggoner 7-L	5	2468
Phillips Pet. Co., Waggoner 2-RR	10	2400
The Texas Co., Harris 1	*	2155
Waggoner Ref. Co., Waggoner 1-L	555	2410
YOUNG COUNTY—		
Bratcher et al, Edwards 3	65	490
Casey & Graham, Porter 1	*	670
Cunningham et al, Edwards 1	*	520
Pennell et al, Calvin 2	50	571
Richards et al, Campbell 3	*	920
Robert Oil Corp., Garvey 1	*	848
The Texas Co., Stewart 1-B	30	742
Williamset et al, Bagley 3	*	651
Wooten Reed, Vick 1	*	605
CENTRAL WEST TEXAS		
BROWN COUNTY—		
A. D. Bruce et al, Shields 5	*	493
E. T. Green et al, Riordan 3	*	1192
Humble O. & R. Co., Hodnett 20-A	25	1172
Tervooren 1	3	995
Harry McGee et al, Daniels 1	*	1406
Paramount Oil Roy., Inc., Mayes 4	*	665
Prairie O. & G. Co., Hargrove 2	5	1923
The Texas Co., Byler 5	5	1322
CALLAHAN COUNTY—		
DeLange & McKague, Johnson 1	*	1620
Moutray Oil Co., Hatchett 1-B	*	855
R. N. Webb et al, Harris 1	*	492
COLEMAN COUNTY—		
Broderick & Calvert, L. Weaver 1	*	1861
Schermerhorn Oil Co. et al, Eddington 2	¶2½	1112
R. V. Whiteside et al, McCreary 1	*	640
EASTLAND COUNTY—		
Gholson et al, Fox 1	*	1140
Swoveland et al, Busbee 1	*	1530
ERATH COUNTY—		
Hickory O. & G. Co., Mauldin 1	¶1	3390
SHACKELFORD COUNTY—		
Grisham-Hunter Corp., Davis 1	20	1643
Roeser-Pendleton-Marland Prod. Co., Cook 37-A (Sec. 61)	40	1388
Cook 39-A (Sec. 61)	40	1228
Cook 10-A (Sec. 83)	50	1405
Simms Oil Co., Lones 7	50	841
WEST TEXAS		
FISHER COUNTY—		
Cranfill-Reynolds and Sun Oil Co., Brown 1	50	3197
HOWARD COUNTY—		
Gulf Prod. Co., Clay 5	60	1847
Humble O. & R. Co., Clay 2	105	1868
Hyer & Yates, Clay 3	85	1864
Merrick & Lamb, Clay 7	80	1788
Mid-West Explo. Co., Clay 2-C	70	1824
Shell Pet. Co., Settles 1	800	2956
Ward Oil Co., Roberts 3	550	2980
Roberts 5	400	2970
PECOS COUNTY—		
The California Co., Smith 1, Lse 4, (Sec. 15)	*	1786
Mid-Kansas-Transcontinental, Yates 8-H	39,000	1574
Pecos Valley Oil Co., Fee 2	80	1632
WARD COUNTY—		
Atlantic & Delmar Oil Co., Hayzlett 1	75	2485
WINKLER COUNTY—		
Gulf Prod. Co., E. W. Cowden 3	13,400	2936
Humble O. & R. Co., Hendrick 6-C, (Sec. 10)	435	3028
Independent O. & G. Co., Morton-Russell 1	*	3165
Pure Oil Co., Ida Hendrick 1	430	2933
Southern Crude & Westbrook, Hendrick 31-M-T-88	2,500	2822
Shell Pet. Corp. & Llano Oil Co., Scarborough 4	110	3315

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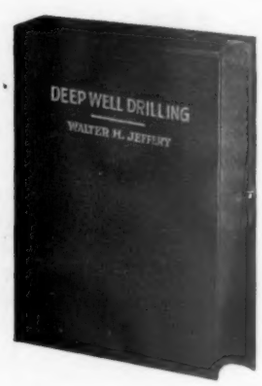

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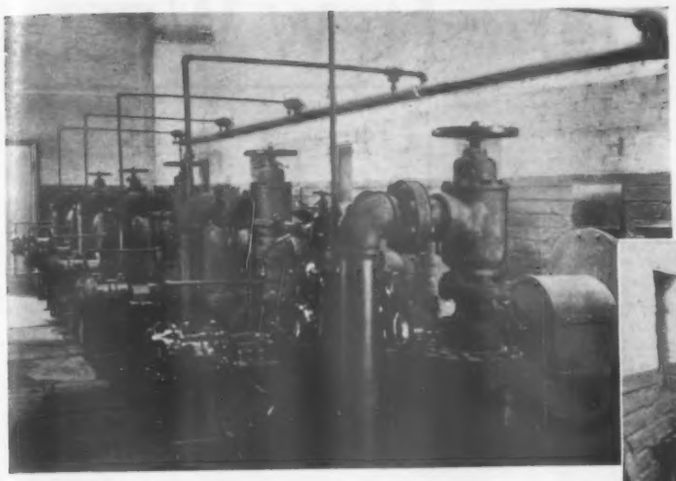

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PERMITS GRANTED FOR NEW WELLS

WEEKLY COMPARISON OF NEW WELLS

Following is a condensed table giving a comparison of permits or locations made for new wells during the past year in Kansas, Oklahoma, Arkansas, Louisiana, Texas, California and the Mountain States:

	Week ending Mar. 16	Previous week	Total this month	Total this year	This week Last Yr.	This month 1928	1928 year total
Arkansas	2	7	11	34	3	13	331
California	12	35	80	318	10	52	1,207
Louisiana	22	10	53	163	11	51	680
Kansas	36	13	61	210	30	62	1,032
Oklahoma	62	51	162	648	62	193	3,744
Texas	118	146	409	1,630	176	497	8,297
Total	252	262	776	3,004	292	868	15,291

KANSAS

CHAUTAUQUA COUNTY—Syndicate Oil Corp.'s Westerfield 7, sw nw ne, 1-32-8e.

CLAY COUNTY—Skow Bros. et al's sw se, 16-9-4e.

COFFEE COUNTY—Spencer & Derby Oil Co.'s Crandall 1, nw sw, 14-23-15e.

COWLEY COUNTY—Foster et al's Refinery 1, nw, 36-34-3e. Lewis Prod. Co.'s Sitton 1, ne se nw, 30-31-6e.

GREENWOOD COUNTY—Empire Oil & Refg. Co.'s Edwards 12, se nw, 21-23-11e.

HARVEY COUNTY—Jolly-Ogg Pet. Co. & Foster Pet. Co.'s Harpp 1, se ne, 22-23-1w.

KIOWA COUNTY—Wilcox et al's Woodward 1, ne, 35-27-17w.

MARION COUNTY—General Util. Corp.'s Propp 1, ne se swm, 8-19-4e. Tidal's Ewert 1, nw sw sw, 7-19-3e. General Util. Corp.'s Siebert 1, c nw, 17-19-3e.

McPHERSON COUNTY—McPherson O. & G. Co.'s Rasmussen 1, sw, 8-18-3w.

ROOKS COUNTY—Derby Oil Co.'s Kruse 1 (owdd) ne nw ne, 3-10-16w. Krueger et al's Stites 1, nw se sw, 12-9-16w.

RUSSELL COUNTY—Texas' Leonard 1, nw, 6-13-15w; Jacobs 1, sw, 31-12-15w.

SEDGEWICK COUNTY—Derby Oil Co.'s Gorman 2, ne nw sw, 6-26-1e. Bu Vi Bar, et al's Wright 4, se ne, 12-26-1w. Vickers Pet Co.'s Nissen 3, nw sw ne sw, 6-26-1e. Bu Vi Bar et al's Shawver 4, sw nw, 7-26-1e; Branch 2, se sw se sw, 6-26-1e. Twist et al's Rayburn 1, nw sw se, 4-25-1w. McBride Oil Co.'s Black 1, ne, 36-25-1w. Reynolds ½ Rogers' Updigraff 1, se sw se, 26-25-1w. La Fonte et al's Carlton 1 se sw, 24-28-1e. Blankenship & Washoma Oil Co.'s Tuttle 1, sw nw, 1-27-1e. J. R. Robertson et al's Stewart, ne nw sw, 29-25-1e. Skelly et al's Stambach 2, nw sw sw, 31-25-1e. Meridian Oil Co.'s Perrin 1, se, 25-25-1w. Whittaker et al's Cantrell 1, sw ne sw ne, 36-25-1w. Bu Vi Bar Pet. Co. et al's Eemrich 2, sw se sw, 6-26-1e; Shawver 5, nw ne nw nw, 7-26-1e. Kroder et al's Hayden 1, sw nw sw, 20-26-1e. T. B. Slick et al's Rosenhagen 1, sw se ne, 33-27-4w.

SUMNER COUNTY—Marland's Curry 1, nw sw, 26-34-2e.

CALIFORNIA

KETTLEMAN HILLS—Standard Oil Co.'s Armstrong 81,10-22-17. Bolsa Chica Oil Corp.'s Ferguson 1, 24-22-17.

LAWNDALE—McKeon Drilling Co., Inc.'s Fee 1, 17-3-14.

LONG BEACH—Continental Oil Co.'s Denio 2, 24-4-13.

MIDWAY—Standard Oil Co.'s No. 4, 1-32-23; No. 16, 29-32-24.

RICHFIELD—Rawco, Inc.'s Rawco 2, 33-3-9.

SANTA BARBARA COUNTY—F. G. Anderson, Trustee's No. 1, (-)-4-28.

SANTA FE SPRINGS—York-Smullin Oil Co.'s Wickman 5, 5-3-11. General Pet. Corp.'s Santa Fe 129, 5-3-11; Santa Fe 136, 5-3-11.

VENTURA—Shell Oil Co.'s Taylor 40, 28-3-23.

ARKANSAS

UNION COUNTY—Skelly Oil Co.'s M. V. Kelly 2, 2310 ft n and 230 ft w of se c of 9-17-15. Gulf Ref. Co. of La.'s Rosa L. Cook 1, 300 s 300 e nw c se ne 1-18-15.

OKLAHOMA

BLAINE COUNTY—C. E. Love et al's Phillips 1, c nw sw, 13-19-10w.

CADDO COUNTY—Wirt Franklin's Vann 1, sw nw nw, 4-5n-9w.

CARTER COUNTY—Magnolia's Johnson 1 (owdd), se ne, 32-1s-3w.

CREEK COUNTY—William Sherry & Carter's Mesquite 2, sw se ne, 36-19-9e; Harmon 2, sw se ne, 28-19-9e. Dixie Oil Co.'s Dickinson 6, se, 7-19-9e. Magnolia's Deere 11, sw, 7-17-7e (owdd). Virginia's West 2, se sw nw, 16-16-10e. D. W. Franchot et al's Garrett 2, nw ne sw, 16-16-10e. Lockhart Gas Co.'s Hogan 1, ne nw nw, 24-15-12e.

GRADY COUNTY—Oklahoma Gas Util. Corp.'s Goerty 2, se ne se se, 26-4n-8w.

HUGHES COUNTY—Harris-Hays Oil Co.'s Manley 2, csl se se, 13-9-9e.

KAY COUNTY—Marland's North Lease No. 24, (owdd), sw nw sw, 6-26-1w. Anolu Oil Co.'s Barr 2 (owdd) c ne nw, 16-27-1w.

LINCOLN COUNTY—Magnolia's Decker 1, se sw se, 8-14-4e.

McINTOSH COUNTY—Spring Valley Oil Co.'s Carr 1, se ne nw, 16-10-13e.

MUSKOGEE COUNTY—Tulpkogee Oil Co.'s Thompson 1, nw ne, 31-15-20e.

OKFUSKEE COUNTY—Minnehoma's Fixico 2, sw se, 29-12-10e. Mid Continent's No. 1, nw ne, 33-10-9e.

OKLAHOMA COUNTY—McElroy & Wall's Hartzell 1, nw sw, 6-11-2w.

OKMULGEE COUNTY—Denton & Marshall's Jefferson 1, se ne sw, 25-15-14e.

OSAGE COUNTY—Tidal No. 1, sw ne, 25-24-8e; Tidal No. 1, sw se, 24-24-8e. L. G. Stanley's No. 6, nw sw sw se, 36-22-8e; No. 1, se ne, 14-21-8e.

PAWNEE COUNTY—Hay et al's Copeland 1, se sw sw, 26-20-9e. Devonian Oil Co.'s Copeland 1, sw se sw, 26-20-9e.

PONTOTOC COUNTY—Superior's Maulden 4, nw sw nw, 32-5-5e. Ramsey's Miller 7, ne se se, 18-5-8e. Westheimer & Daube Noll Wade, sw se sw, 19-5-8e.

POTTAWATOMIE COUNTY — Phillips' Reed 1, ne nw nw, 8-9-5e. Magnolia's Singletary 1, se sw, 15-7-4e. Darby's Youngblood 2, sw se nw, 16-7-4e. Skelley's Decker 1, ne nw sw, 16-7-4e. Magnolia's Rowe 1, ne nw sw, 18-7-5e.

SEMINOLE COUNTY—T. B. Slick's Ripley 1, ne sw se, 12-8-5e; Nellie 5, nw se se, 12-8-5e. Barnsdall's Barkus 2, nw sw ne, 26-7-5e. Gypsy's Cotcha 8, sw, 23-7-6e. T. B. Slick's Harris 1, nw, 26-7-6e; Ragland 1, nw ne sw, 36-7-6e. Sinclair's Harjo 3, ne sw se, 11-8-5e. T. B. Slick's Fulton 2, ne se, 13-8-5e. Superior's Ingram 3, ne nw nw, 1-9-5e. Carter's Skiff 1, se ne, 10-9-6e. Gypsy's Barkus 11, cnl sw, 6-8-6e; Mission 8, sw se se, 6-8-6e; Doser 5, nw ne ne, 7-8-6e. Empire Cotcha 1, ne se ne, 27-7-6e. Texas' Lucy 9, ne nw ne, 19-5-8e. Carter's Larney 1, se sw nw, 26-7-6e. Shaffer's Grisso 1, nw se, 7-9-7e. Pure's Louisiana 1, ne sw, 15-9-7e.

STEPHENS COUNTY—Pace et al's McMasters 3, sw ne ne, 13-2s-8w. Atlantic's Taylor 3, nw sw nw, 12-1s-4w. Lone Eagle's Simpson 3, ne nw se, 34-1s-8w. Magnolia's Kagay 21, nw se se sw, 34-1s-8w. American Pipe Line Co.'s Nigh 4, sw se nw, 34-1s-8w. Magnolia's Stevens 10, nw ne nw, 33-1s-8w; Shaffer-Young 7, nw sw se sw, 29-1n-8w.

TULSA COUNTY—F. A. Baker's Davis 1, se ne, 26-19-11e.

WAGONER COUNTY—C. F. Finefield, Vann 6, c n½ sw, 22-17-19e.

LOUISIANA

BOSSIER PARISH—R. L. Crook, et al, Shreveport, Larkin 11, 14-19n-11w, 600 ft e and 400 ft n of sw c nw sw.

CADDO PARISH—Bayou State Oil Corp., Shreveport, Jolley 27, 22-22n-15w, 200 ft n and 550 fe w of se c se nw. J. O. A. Carper, Tr., Denver, Colo., Hammock 2, 34-18n-16w, 660 ft s and 660 ft w of ne c. Nemours Corp., Shreveport, C. Ellerbee 1, 18-15n-12w, 1700 ft w and 2351 ft s of ne c. C. B. Moore, Mooringsport, Dillon 5, 22-20n-15w, 600 ft n and 200 ft e of sw c. Simplex Oil Co., Inc., Shreveport, Geo. O. Baird 4, 22-20n-15w, 1120 ft w and 800 ft s of ne c.

CALCASIEU PARISH—J. O. Davis, Beaumont, Texas, D. D. Mims 1 (amended permit), 20-9s-7w, 1550 ft e and 50 ft s of nw c.

CAMERON PARISH — Calcasieu Oil Co., Magnolia Pet. Co. and Union Sulphur Co., Houston, Texas, Valery 6, 36-12s-10w, 1592 ft w and 772 ft s of se c Sec. 13 in Sec. 36. Cameron Oil Co., Inc., Vinton, La., Kaough 1, 28-12s-10w, 80 ft n and 50 ft w of se c nw sw. Federal Pet. Co., Houston, Texas, Duhon 2, 28-12s-10w, 80 ft s and 280 ft w of ne c sw. Federal Pet. Co., Houston, Texas, Kaough 4, 28-12s-10w, 80 ft n and 280 ft w of se c nw sw. Moon Oil Co., Lake Charles, Sauner 3, 28-12s-10w, 1470 ft n and 1535 ft e of sw c. Rex Pet. Corp., Vinton, La., Noble 1, 28-12s-10w, 50 ft s and 50 ft e of nw c se sw.

GRANT PARISH—R. E. Collins, Monroe, Hardtner & Tannehill 1, 9-6n-1w, 462 ft n and 528 ft w of se cor. of se¼ of ne¼.

IBERIA PARISH—Gulf Refg. Co. of La., Houston, Tex., La. State Z-9, 26-11s-8e, apprx. 7294 ft e and 59 ft s of center.

LA FOURCHE PARISH — Union Sulphur Co., Sulphur, Dibert, Stark & Brown Cypress Co. 3, 70-15s-15e, 1270 ft n and 1270 ft e of sw c.

LA SALLE PARISH—G. W. Zoder, Alexandria, King 1, 13-10n-1e, 150 ft w and 600 ft n of se c ne. Arkansas Fuel Oil Co., Shreveport, Urania Lbr. Co. B-10, 17-10n-2e, 366 ft n and 227 ft e of sw c nw.

MOREHOUSE PARISH — Industrial Gas Co., Bastrop, Crowder-Moore 1, 31-21n-5e, 2695 ft e and 950 ft s of nw c. Natural Gas Producing Co. of La., Bastrop, Crossett 24, 25-21n-4e, 2640 ft s of nw ne ne.

OUACHITA PARISH—Imperial O. & G. Products Co., Monroe, Stubbs 7, 44-19n--3e, 2030 ft n and 1450 ft w of se c. United Carbon Co., Monroe, Abe Arent 1, 14-19n-3e, 660 ft s and 660 ft w of ne c.

UNION PARISH — Natural Gas Producing Co., Bastrop, Nolan 1, 11-20n-3e, 1400 ft w and 660 ft s of ne c.

TEXAS

ARCHER COUNTY—C. B. Long et al, Wichita Falls, Kemp & Kempner 1, B 67, W. V. F. L. sur, 1470 ft from e and 150 ft from s line; Taber 1, B 9, D. C. S. L. sur, 450 ft from e and 150 ft from s line. Rathke Oil Co., Wichita Falls, Parish 1, B 2, S.P. Ry. sur, 150 ft from n and e lines. McLaughlin Bros., Wichita Falls, Parkey 1, B 21, D. C. S. L. sur, 150 ft from ne and e lines. Frank Hutcheson, Archer City, Hutcheson C1, S 123, J. Osborne sur, 150 ft from n and e lines. L. G. Bradstreet Co., Wichita Falls, Snider 6, R. Wilson sur, 150 ft

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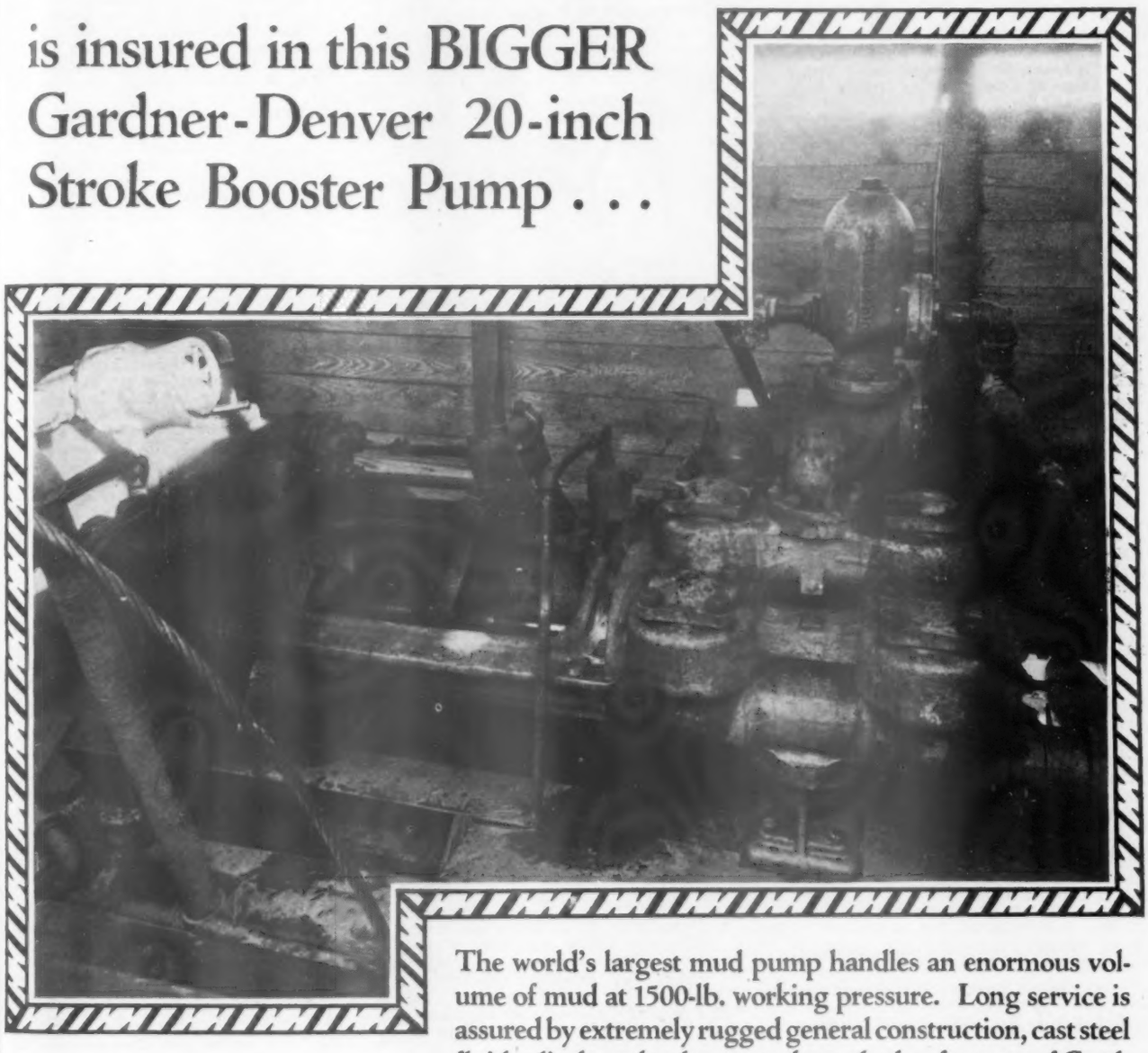
is insured in this BIGGER Gardner-Denver 20-inch Stroke Booster Pump . . .



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Send for bulletins on Gardner-Denver slush and oil line pumps in any size and with any desired type of drive.

from n and 510 ft from w line. Gulf Prod. Co., Fort Worth, Ward 4, B.B.B.&C. sur, 450 ft from s and w lines. Prairie O. & G. Co., Ranger, Dickson 1, T. McCoy sur, 450 ft from e and 150 ft from s line.

BROWN COUNTY—F. D. Williamson et al, Brownwood, Edington 5, No. 141 R. Mitchell sur, 500 ft from w and 250 ft from s line. Culbertson Bros. Co., Fort Worth, Smoot 1, No. 3 A. Scott sur, 150 ft from s and w lines. Humble, Wichita Falls, Armstrong 15, J. Delgado sur, 466 ft n of No. 14.

BEXAR COUNTY—W. M. Morgan, 808 East Houston St., San Antonio, Martin 1, 155 ft from n and 200 ft from e line. Amelia Balzart, San Antonio, Adams 2, 2 Gotari sur, 150 ft from w and 300 ft from s line.

BRAZORIA COUNTY — Humble, Wichita Falls, T. & W. 4, M. Varner sur, 50 ft from n and 250 ft from w line.

CALLAHAN COUNTY—Gibson & Johnson, Abilene, Snyder 4B, S 141, B.B.B.&C. sur, 150 ft from s and e lines. F. E. Shaheen, Abilene, Fee 2, S 17, B 5, S. P. Ry. sur, 150 ft from s and w lines. Oyster & Rife, Abilene, Williams 1, S 1, B 1, S. P. Ry. sur, 330 ft from e and 300 ft from s line. Texas Co., Wichita Falls, Hatchett 24, S 24, D.&D. Asy. sur, 767 ft from w and 140 ft from s line.

CALDWELL COUNTY—Shell Pet. Corp., Houston, New 1, J. Hinds sur, 150 ft from s and w lines; New 2, 150 ft from w and 490 ft from s line; New 3, 150 ft from w and 834 ft from s line; Now 4, 150 ft from w and 490 ft from s line. Adams & Lyles, Lockhart, Branyon 2, J. R. Miller sur, 450 ft from n and 150 ft from e line. United North & South Dev. Co., San Antonio, Gideon 1, M. G. Dykes sur, Hu. Humble, Houston, Briscoe 2, J. Hinds sur, 207 ft from n and 150 ft from w line; Johnson B 1, J. Hinds sur, 350 ft from n and e lines; Brisco 1, J. Hinds sur, 150 ft from s and w lines; Moses & Baggett B 5, S. Shupe sur, 150 ft from e and 1911 ft from s line; Moses & Baggett 6, 150 ft from e and 2211 ft from s line; Moses & Baggett 7, 150 ft from s and 995 ft from e line; J. R. Tiller A 3, J. Hinds sur, 150 ft from n and w lines; J. D. Wright 2, G. Hinds sur, 450 ft from n and 150 ft from w line; J. R. Tiller B 2, J. Hinds sur, 150 ft from w and 1410 ft from s line.

COCHRAN COUNTY—Marland Prod. Co., Fort Worth, Slaughter 1A, S 130, C.C.S.L. sur, 100 ft n of No. 1.

COLEMAN COUNTY — Whiteside & Mitchell, Coleman, McCreary 1, No. 217, J. S. Martin sur, 150 ft from s and e lines. Jamison, Pollard & Forster & Dunigan, Coleman, Rice 1, B 91, B.&S. sur, 200 ft from n and w lines. Denton & Blackwell, Amarillo, Eubank 1, B 48, C.C.S.L. sur, 450 ft from e and 150 ft from s line. Stepp & Keister, Knoxville, Tenn., Shore 1, S 72, B 1, G.H.&H. sur, 900 ft from n and 1100 ft from e line. Rex-Tex Oil Co. & Py-Tex Oil Co., Fry, Baker 1, S 630, B 7, nw corner.

COOKE COUNTY — Texas Co., Wichita Falls, Dennis 6, T. J. Hutchinson sur, 300 ft s of No. 5.

CLAY COUNTY—Wirt Franklin, Ardmore, Okla., Wolf 1, B 7, B.B.B.&C. sur, 660 ft from s and e lines.

ERATH COUNTY—F. L. Walker et al, Strawn, Fuller 1, J. M. Espinosa sur, 400 ft from n and 450 ft from w line.

EASTLAND COUNTY — States Oil Corp., Eastland, Calvert 8, S 17, B 4, H.&T.C. sur, 550 ft from e and 260 ft from s line. S. A. Hopkins et al, Cisco, Jones 2, S 43, B 4, H.& T.C. sur, 589 ft from s and 2881 ft from e line. Atwood et al, Ranger, Simmons 2, McL.C.S.L. sur, 1050 ft from n and 150 ft from w line. Belva Oil Co., Eastland, Good 7, J. R. Stubblefield sur, 575 ft from e and 154 ft from s line.

FORT BEND COUNTY—Gulf Prod. Co., Houston, Luscher 15, T. Hobermaker sur, 400 ft n of No. 8. Navarro Oil Co., Houston, Overley B6, H. Shropshire sur, 50 ft from n and 400 ft from e line.

GONZALES COUNTY—Crown Pet. Corp., Dallas, Hattenbach 1, J. Jones sur, 200 ft from s and 900 ft from e line.

GRAY COUNTY—H. F. Wilcox O. & G. Co., Tulsa, Okla., Combs 5, S 37, B 3, I.&G.N. sur, 330 ft from e and 370 ft from n line.

HARRIS COUNTY—Gulf Prod. Co., Houston, Cain 8, No. 98, J. Hamilton sur, 73 ft from w and 50 ft from n line. Davis, McFarland & Posey, Houston, Davis 1, D. McLaughlin sur, 58 ft from n and 1250 ft from e line.

HOWARD COUNTY — Gibson & Johnson, Abilene, Read 1, S 47, B 30, Twp. 1n, 660 ft from s and e lines. Witherspoon-Glasscock, Big Spring, Kloh Ramsey 2, S 3, B 32, 2S, T.&P. sur, 150 ft from e and 280 ft from s line. Plymouth Oil Co., Pittsburgh, Penn., Kloh 2, S 5, B 32, T.&P. sur, 330 ft from s and w lines; Kloh 3, 330 ft from n and e lines. Midwest Exploration Co., Amarillo, Clay C4, S 138, B 29, W.&N.W. sur, 330 ft from s and e lines.

HARDIN COUNTY—Minor Oil Co., Beaumont, Fee 40, 85, S. Jackson sur, 50 ft w of No. 68. Gilbert Co., Beaumont, Fee 39, 106, S. Jackson sur, 129 ft nw of No. 105. Gaddy Oil Co., Beaumont, Oliver-Sternenberg 2, No. 7, G. Dorsey sur, west central part of lease.

HARTLEY COUNTY—Canadian River Gas Co., Amarillo, L. Bivins A 11, S 38, B 20, C.S.S. sur, 1320 ft from s and w lines.

HASKELL COUNTY—Moody Corp., Box 1911, Tulsa, Okla., Reynolds 3, J. Fenner sur, 2120 ft from n and 130 ft from w line.

JACK COUNTY—K. E. Leibhart, Dallas, Walker 1, B. Billingson sur, 200 ft from s and w lines.

JONES COUNTY—Condor Pet. Co., Abilene, McDonald 1, S 125, DeW.C.S.L. sur, 340 ft from n and 240 ft from e line.

JEFFERSON COUNTY—Yount-Lee Oil Co., Beaumont, Gladys 84, B 99, J. A. Veatch sur, 15 ft from w and 63 ft from s line; Gladys 83, B 96, J. A. Veatch sur, 150 ft from w and 155 ft from s line. Unity Oil Co., Beaumont, McFaddin 130, 100, P. Humphreys sur, 725 ft from sw and 500 ft from se line.

LIBERTY COUNTY — Yount-Lee Oil Co. Beaumont, Mitchell 15, M. G. White sur, 1100 ft from s and 50 ft from w line; Mitchell 16 1250 ft from s and 50 ft from w line. Liberty Oil & Sulphur Co., Beaumont, Monroe 1, White sur, 50 ft from n and e lines.

LOVING COUNTY—Lockhart & Co., Pecos, Johnson 1, S 20, B 56, Twp. 1, 660 ft from n and 1980 ft from e line.

LAMB COUNTY—W. H. Dyer, Graham, Elwood 1, S 9, B T, T. A. Thompson sur, center of w line sec 9.

MOORE COUNTY — Phillips Pet. Corp., Bartlesville, Okla., James 3A, M. Robinson sur.

NOLAN COUNTY—L. G. Bradstreet Co., Fort Worth, Kuteman 1, S 95, B X, T.&P. sur, center.

REFUGIO COUNTY — Oigufer Oil Corp., Refugio, M. H. Ryals 1, Refugio sur, nw corned. Houston Gulf Gas Co., Houston, J. A. Lambert 8, Refugio sur, se corner; L. M. Rogers 3, J. Powers sur, 233 ft from e and 606 ft from s line; F. B. Rooke 1, T. Mullen sur, 165 ft from e and 1000 ft from s line; N. B. Cummings 1, Refugio sur, 150 ft from n and w lines; F. V. W. Heard 7, Refugio sur, ne corner.

SHACKLEFORD COUNTY—Midwest Exploration Co., Amarillo, Dyer 4, S 85, B 12, T.&P. sur, 210 ft from e and 950 ft from n line. Home O. & G. Co., Albany, Hughes 9, 531, T.E.&L. sur, 450 ft from nw and 150 ft from ne line. Scott & Walker, Albany, Huskey 9, 568, T.E.&L. sur, 1500 ft from n and 450 ft from w line. Ohio-Texas Oil Co., Albany, Matthews C1, S 29, E. T. Ry. sur. Roeser & Pendleton & Marland Prod. Co., Albany, Cook A11, S 83, E. T. Ry. sur, 405 ft w of No. 9. Loofburrow & Chamness Oil Co., Albany, Bernstein 1, 532, T. E. & L. sur, 150 ft from n and w lines; Berstein 2, 300 ft se of No. 1. Dull Earls Texas Co., Albany, Matthews 6, S 32, B 1, E. T. Ry. sur, 750 ft from n and 450 ft from e line. J. Shulman, Breckenridge, Matthews 1, S 57, E. T. Ry. sur, 600 ft from e and 150 ft from s line. Roeser & Pendleton & Phillips Pet. Corp., Albany, Douglas B3, T.E.& L. sur, 300 ft ne of No. 2. T. G. Shaw, Fort Worth, Rice 535, 26, S 20, Bayland Asy. sur, 300 ft ne of No. 14. A. J. Robinson, Dallas, Blach 8, 372, T.E.&L. sur, 1316 ft from ne and 1716 ft from se line.

STEPHENS COUNTY—W. M. McClaron, Breckenridge, Jackson 1, S 44, B 5, T.&P. sur, 900 ft from w and 1100 ft from s line.

TOM GREEN COUNTY — Concho Pacific Oil Co., Christoval, Rouse 2, S 73, B 3, Eldridge sur, 168 ft from w and 162 ft from s line; Rouse 3, 225 ft from n and 158 ft from e line.

UPSHUR COUNTY—Amerada Pet. Corp., Fort Worth, Wade 1, No. 162, J. H. Fields sur, 978 ft from e and 330 ft from s line.

WICHITA COUNTY—Geo. L. Pace, Wichita Falls, Edgerly 5, S 1, B 43, S.A.&M.G. sur, 150 ft from n and e lines of B 43. E. J. Stump, Wichita Falls, Boyd 1, J. T. Lewis sur, 150 ft from n and 450 ft from e line. D. M. Ross, Wichita Falls, Mitchell 16, P. Castleman sur, 300 ft e of No. 12. G. H. Howell, Wichita Falls, Foster 1, S 1, H.T.&B. sur, 150 ft from s and w lines. Curt Buddrus, Wichita Falls, Cole 2, P. P. C. S. L. sur, 300 ft w of No. 1.

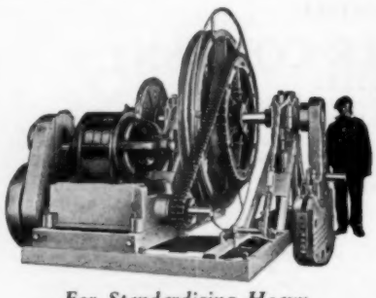
WINKLER COUNTY—Prairie O. & G. Co., Ranger, Daugherty 2, S 16, B 74, P. S. L. sur, 330 ft from n and 990 ft from w line. Humble, Wichita Falls, T. G. Hendrick 10, S 10, B B12, 800 ft s of No. 3. Atlantic Oil Prod. Co., Magnolia Bldg., Dallas, T. G. Hendrick B 5, S 44, B 26, 1320 ft from n and 2310 ft from e line S 4.

WASHINGTON COUNTY — Sun Oil Co., Beaumont, G. F. Grote 7, N. Clay sur, 400 ft. sw of No. 5; Witt 2, J. F. Perry sur, 200 ft from sw and 150 ft from se line; Schirmer 2, N. Clay sur, 150 ft from nw and 521 ft from ne line. Watt Oil Co., Houston, Giddings 1, S. Clark sur, 150 ft from n and 600 ft from e line.

WHEELER COUNTY — W. A. Edwards, Shamrock, Griswold 1, S 1, B 24, H.&G.N. sur, center of s½.

YOUNG COUNTY — Transcontinental Oil Co., Tulsa, Okla., Corbett 1, R. Campbell sur, 150 ft from n and 360 ft from w line. O. Bratcher et al, Loving, Edwards 60, 3, S. Tynes sur, 1010 ft from n and 600 ft from e line. T. W. Callender, Wichita Falls, Rushing 1, 3401, T.E.&L. sur, 150 ft from n and 650 ft from e line. Camp O. & G. Co., Wichita Falls, Jones 1, 60, T.E.&L. sur, 150 ft from w and 1350 ft from s line. C. C. Williams, Jean, Bagley 3, P. Averitt sur, 150 ft from sw and 600 ft from se line; Bagley 1, 750 ft from sw and 150 ft from se line.

ZAPATA COUNTY—O. W. Killam, Laredo, Hinnant 3, S 74, S.K.&K. sur, 1908 ft from w and 1470 ft from s line; Cuellar 12, J. M. Pereda sur, 1215 ft from sw and 1170 ft from se line.



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New "G" Slush Pump

14½x7¼x18″

The popularity of the new Gumbo Buster "G" Slush Pump was established by its highly satisfactory and economical performance under severe conditions. Watch it in action and see for yourself its many points of superiority.

ADVANTAGES

1. *SIZE*
   Diameter of steam end 14½″; Diameter of water cylinder 7¼″; Length of stroke 18″.
2. *WEIGHT*
   Weighs only 10,700 pounds. Lightest pump of similiar size and use.
3. *STRENGTH*
   Water end made from CHROME NICKEL CAST ELECTRIC STEEL. Strong enough to safely withstand any pressure up to 2,000 pounds. Water end and steam end riveted to strong steel skids in ten different places.

Due to long 18″ stroke pump runs slowly, which reduces wear on all moving parts, which in turn reduces cost of upkeep.

WATER END ADVANTAGES:

1. LIGHT WEIGHT.
2. STRONG.
3. WATER END MADE IN FOUR PIECES.
   Not necessary to throw entire water end away, should anything happen such as cutting out around valve seats.
4. *ACCESSIBILITY.*
   Every part conveniently located so repairs can be easily and quickly made.

STEAM END ADVANTAGES:

1. PATENTED BALANCED PISTON VALVES.
   Patented rings fit closer and wear longer than ordinary rings.
2. CONVENIENTLY LOCATED AND PROTECTED CUSHION VALVES.
   Cushion valves regulate and lengthen stroke.
3. STEAM END MADE IN FOUR PIECES.
   Piston valve cylinders, steam cylinders, housing or cradle and steam end legs are separate castings. Any piece can be replaced.
4. TWO LEGS UNDER STEAM END FOR STRENGTH.

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OIL AND GAS WELL SUPPLIES

ROTARY AND CABLE TOOLS

WILDCATS FROM ALL SECTIONS

OKLAHOMA

GRANT COUNTY—T 28n, R 3w, Sec. 24, Lario O. & G. Co. et al's Conneil 1, nwc; 6-inch at 3860 ft.

WOODS COUNTY—T 27n, R 16w, Sec. 33, Sinclair's Share 1, c ne sw, rig.

KAY COUNTY—T 26n, R 2e, Sec. 32, J. A. Vincent & Nat'l Union's McNeil 1, nwc ne, sd 2795 ft.

HARPER COUNTY—T 25n, R 22w, Sec. 14, Hoffer Oil Co.'s Cooper 1, nwc se, sd 4182 ft.

WOODS COUNTY—T 25n, R 15w, Sec. 10, Bu Vi Bar et al's 1, sec sw, R.U.S.T. 4208 ft.

GRANT COUNTY—T 25n, R 4w, Sec. 22, Cowden's Vollner 2, nec se ne sw, lost tools 5640 ft sd.

WOODWARD COUNTY—T 24n, R 17w, Sec. 32, Otstot Dev. Co.'s Simmons 1, sec, sd 1500 ft.

WOODS COUNTY—T 24n, R 13w, Sec. 18, Miller et al's Capenhaver 1, nwc, spudded and sd.

ALFALFA COUNTY—T 24n, R 11w, Sec. 14, Washoma Oil Co.'s Acre 1, swc ne, rig.

GARFIELD COUNTY—T 24n, R 6w, Sec. 9, Pulse & Beamer's White 1, sec nw, sd 4755 ft.

WOODWARD COUNTY—T 23n, R 20w, Sec. 9, Billy Oil Co.'s Wyatt 1, c se, sand 3200-40 ft hwf. T 23n, R 17w, Sec. 2, John Farrand's Belva 2, csl sw se, drlg. 385 ft.

MAJOR COUNTY—T 23n, R 16w, Sec. 4, Wilson et al's Creech 1, nec sw, sd 150 ft.

WOODWARD COUNTY—T 21n, R 21w, Sec. 25, Sharon's Elmore 1, swc, sd 3025 ft. T 21n, R 19w, Sec. 15, Burgoyne Bros'. 1, swc se ne, sd 1950 ft.

MAJOR COUNTY—T 20n, R 14w, Sec. 23, Keller et al's Horton 1, c ne ne, spudded and sd.

GARFIELD COUNTY—T 20n, R 4w, Sec. 9, Marland's Looman 1, nec se, sd 5738 ft. Sec. 12, Marland's Miller 1, swc, sd 4586 ft hfw.

BLAINE COUNTY—T 19, R 10w, Sec. 13, C. E. Love et al's Phillips 1, c nw sw, rig.

DEWEY COUNTY—T 18n, R 15w, Sec. 9, Huckelby & McCoy's Perfect 1, nec, sd 4500 ft.

LOGAN COUNTY—T 18n, R 3w, Sec. 33, Healy & Consolidated Drlg. Co.'s Quier 1, sec sw, sd 3970 ft.

KINGFISHER COUNTY—T 16n, R 6w, Sec. 27, Crawford & McKenna's Sturgeon 1, nec sw, sd 4895 ft.

BLAINE COUNTY—T 15n, R 12w, Sec. 26, W. J. Donley's Dickens 1, sec nw, sd 4509 ft.

CANADIAN COUNTY—T 14n, R 6w, Sec. 9, A. D. Spears' Piatt 1, swc ne, sd 3223 ft.

OKLAHOMA COUNTY—T 13n, R 3w, Sec. 18, Slick & Bailey's Lufkin 1, c ne se, ur 5-inch at 5120 ft.

CIMARRON COUNTY—T 5n, R 5e.c.m., Sec. 22, Magnolia's School Land 1, c se ne, drlg 1265 ft.

TEXAS COUNTY—T 1n, R 15e.c.m., Sec. 25, Skaer et al's Hitch 1, nwc, rigged up and sd.

OSAGE COUNTY—T 29n, R 8e, Sec. 30, Superior Oil Corp's 1, nwc ne, drlg 1226 ft. T 26n, R 7e, Sec. 13, Wrightman's 1, sec nw, location.

PAWNEE COUNTY—T 22n, R 5e, Sec. 33, Washoma O. & G. Co.'s Buffalo 1, sec nw, td 3812 ft pb to 3200 ft cemtg.

OSAGE COUNTY—T 22n, R 8e, Sec. 8, Harry McGill's 1, swc se, show gas at 2335-45 ft, sd 2688 ft.

LINCOLN COUNTY—T 16n, R 4e, Sec. 15, J. V. Bailey et al's House 1, c ne se, fshg tools at 3660 ft. T 16n, R 5e, Sec. 2, L. G. Wheeler Mote, et al's Wolfe 1, nwc ne sw, R.U.S.T. 2702 ft. T 16n, R 6e, Sec. 19, Flynn & Morgan's Finely 1, swc, rigging up. T 12n, R 3e, Sec. 29, Phillips' Robertson 1, sec nw, rig.

McINTOSH COUNTY—T 12n, R 18e, Sec. 15, A. B. Wolfe et al's Beck 1, nwc se, spudded and sd.

PITTSBURG COUNTY—T 9n, R 16e, Sec. 32, Pattison et al's McDuff 1, swc nw se, Wilcox 5443-73 ft, drilling but making no hole.

HASKELL COUNTY—T 9n, R 18e, Sec. 10, Marion Oil Co.'s Sanders 1, nwc ne sw, sd 1800 ft.

LATIMER COUNTY—T 5n, R 18e, Sec. 15, Limestone O. & G. Co.'s Murry 1, swc, 1½M gas at 2518-30 ft, drlg 3000 ft.

OKLAHOMA COUNTY—T 12n, R 2w, Sec. 30, Magnolia's Noble 1, nwc sw sw, drlg 1250 ft. T 12n, R 3w, Sec. 15, Cromwell's Thompson 1, swc ne ne, fshg 7182 ft.

OKFUSKEE COUNTY—T 11n, R 7e, Sec. 21, Slick's Wolfe 1, sec ne se, ur 6-inch at 4458 ft.

SEMINOLE COUNTY—T 11n, R 7e, Sec. 34, Phillips' Mills 1, nwc sw, drlg 4475 ft hfw.

CLEVELAND COUNTY—T 10n, R 2w, Sec. 8, Slick & Phillips' Sudik 1, c ne ne, setg 9-inch csg at 5500 ft.

SEMINOLE COUNTY—T 10n, R 6e, Sec. 16, McCulloch et al's Hollis 1, sec nw, drlg 2185 ft. T 10n, R 7e, Sec. 5, Marland et al's Srothers 1, nwc se ne, cemtg 6-inch at 4833 ft.

POTTAWATOMIE COUNTY—T 8n, R 3e, Sec. 12, Slick's Nix 1, sec nw nw, drlg 4667 ft.

SEMINOLE COUNTY—T 8n, R 8e, Sec. 4, McCulloch's McGilbray 1, swc ne, T. S. 3285 ft, td 3325 ft.

CLEVELAND COUNTY—T 7n, R 1w, Sec. 15, Sooner Oil Co.'s Vandeveer 1, nec nw sw, sd 3120 ft.

POTTAWATOMIE COUNTY—T 6n, R 4e, Sec. 19, Rush & Baughn's Lester 1, sec ne ne, drlg 3045 ft.

SEMINOLE COUNTY—T 6n, R 5e, Sec. 11, McCulloch's Powell 1, nwc, R.U.R. T 6n, R 7e, Sec. 34, Magnolia's Harjo 1, nec se, drlg 1610 ft.

PONTOTOC COUNTY—T 5n, NR 4e, Sec. 36, Denver P&R Corp.'s Roberts 1, sec ne ne, drlg 1800 ft.

HUGHES COUNTY—T 5n, R 9e, Sec. 17, E. W. Whitney's Huddleston 1, sec sw, ur 5-inch at 3400 ft sd.

PONTOTOC COUNTY—T 4n, R 8e, Sec. 23, Independent's Hampton 1, nec, drlg 645 ft.

PITTSBURG COUNTY—T 4n, R 12e, Sec. 32, Kerr & Key's Tall 1, c nw nw, setg 12-inch 1000 ft.

COAL COUNTY—T 2n, R 8e, Sec. 6, J. S. Cosden's Richardson 1, nwc ne ne, drlg 600 ft. T 1n, R 9e, Sec. 24, Galbreath et al's Jones 1, swc se, fishg 3350 ft. T 1n, R 11e, Sec. 10, I.T.I.O.'s Cook 1A, sec sw nw, drlg 6535 ft.

CUSTER COUNTY—T 14n, R 14w, Sec. 1, W. E. Witt's Wellman 1, c se, sd 100 ft.

ROGER MILLS COUNTY—T 11n, R 26w, Sec. 4, L. C. Hivick's Davis 1, c nw ne, sd 700 ft.

CANADIAN COUNTY—T 10n, R 6w, Sec. 1, J. V. Bailey's Robinson 1, c ne nw, spudded and sd.

BECKHAM COUNTY—T 8n, R 25w, Sec. 30, Benedum & Trees Oil Co.'s Rogers 1, swc, drlg 100 ft. T 8n, R 22w, Sec. 20, Carson et al's Denby 1, swc se ne, csg at 1172 ft. T 8n, R 21w, Sec. 33, Day Oil Co.'s Ault 1, c nw nw, drlg by tools 1508 ft.

KIOWA COUNTY—T 7n, R 17w, Sec. 34, G. B. Cloyes' Brazil 1, swc ne, drlg 1140 ft. T 7n, R 15w, Sec. 35, David Malernee's Van Kirklan 1, nwc, sd 858 ft, flowing sulphur water.

CADDO COUNTY—T 6n, R 10w, Sec. 22, English Drlg Co.'s Jacobs 2, nwc se, sd 300 ft.

GRADY COUNTY—T 4n, R 5w, Sec. 28, Wichoma Oil Corp.'s Morrison 1, nec, location.

JACKSON COUNTY—T 1n, R 20w, Sec. 4, Houseman et al's Northington 1, nec, sd 2020 ft.

KIOWA COUNTY—T 1n, NR 17w, Sec. 13, Allen Bros'. Howell 1, nwc se, drlg 600 ft.

STEPHENS COUNTY—T 1n, R 7w, Sec. 2, Stahl & Burris' Jefferson 1, sec ne nw, sd 3012 ft.

COTTON COUNTY—T 1s, R 11w, Sec. 34, Shasta Oil Co.'s Indian 1, nec, drlg 1810 ft.

KIOWA COUNTY—T 2s, R 16w, Sec. 6, Landfair 1, sec sw se, sd 2535 ft.

COTTON COUNTY—T 2s, R 12w, Sec. 11, Pearce & Brown's Heitzler 1, nwc, sd 2507 ft. T 3s, R 12w, Sec. 11, Consolidated Oil Co.'s Indian 1, nec sw, location. T 3s, R 11w, Sec. 26, Consolidated Oil Co.'s Conklin 1, nwc, drlg 1535 ft. T 3s, R 10w, Sec. 11, E. J. Stump's Jones 1, nwc ne, location.

STEPHENS COUNTY—T 3s, R 9w, Sec. 22, Pelwin Oil Co.'s King 1, swc se, location. T 3s, R 8w, Sec. 26, E. J. Stump's Simmons 1, swc, drlg 2545 ft.

COTTON COUNTY—T 4s, R 12w, Sec. 16, Guiler & Dyson's Thomas 1, sec sw, sd 2127 ft. T 4s, R 9w, Sec. 31, Amerada's Delana 1, sec nw nw, spudding.

JEFFERSON COUNTY—T 5s, R 7w, Sec. 35, Amerada et al's Major 1, sec nw nw, location.

McLAIN COUNTY—T 5n, R 2e, Sec. 31, Tidal et al's Haberson 1, c se se, rig. T 5n, R 3e, Sec. 22, Mid Continent Pet. Corp.'s James 1, sec, drlg 2200 ft.

GARVIN COUNTY—T 3n, R 3w, Sec. 36, Gilcrease-Douglas Oil Co.'s Barnett 1, sec nw ne, material.

MURRAY COUNTY—T 1n, R 2e, Sec. 17, Revels & McGee's Wolfe 1, nwc, drlg 2495 ft.

GARVIN COUNTY—T 1n, R 3e, Sec. 32, Ramsey's Malickey 1, c sw ne, drlg 1320 ft.

JOHNSTON COUNTY—T 1s, R 7e, Sec. 29, Smith-Kinsley's Lane 1, sec nw, drlg 1425 ft.

CARTER COUNTY—T 4s, R 2e, Sec. 32, Tex-Okla Drlg. Co.'s Anderson 1, sec ne se, drlg 400 ft. T 5s, R 3w, Sec. 19, Devonian Oil Co.'s Myer 1, nwc se, fishg 2976 ft.

BRYAN COUNTY—T 9s, R 9e, Sec. 36, W. G. Endicott et al's Craig 1, c nw ne, drlg 1200 ft.

ABBREVIATIONS

NOTE—The following is the explanation of abreviations, signs, etc., used in completion and wildcat reports: •—dry hole, abandoned well; ‡—salt water; †—junked and abandoned; ¶—million feet of gas; abn—abandoned; bbls—barrels; b.s.—basic sediment; cas casing; co—cleaning out; dk—derrick; dr—drilling; fsh—fishing; ft—feet; in—inches; lcn—location; m—milling; n, s, e, w—north, south, east, west; r—reaming; sd—shut down; sdtr—sidetracking; sp—spudding; sr—straight reaming; std—standardizing; sw—salt water; td—total depth; ur—underreaming; wo—workover; wosr—waiting on standard rig.

KANSAS

BARBER COUNTY—Barbara Oil Co.'s Lytle 1, cnl ne ne sw 12-33-13w, dr 4510 ft. Barbara's Blunk 1, c ne nw 20-34-13w, dr 5300 ft. Roland's et al's Pickens 1, ne nw ne 27-30-14w, 8-inch 4475 ft. Allison & Fitzwilliams' Morrise 1, c nw se se 9-30-12w, rig.

BUTLER COUNTY—Smith & Ash's Donnelly 1, nec 8-24-6e, spd. Phillips & Shell's McClellan 1, se sw 23-26-6, rig. LaRobb et al's Bronsenger 1, ne se 24-27-3e, ru.

CHASE COUNTY—Grisner ½ Fowler's Carson 1, ne ne 9-21-7e, sd 3150 ft. Haulkey et al's Ryan 1, nwc ne 22-19-8, d 225 ft.

COWLEY COUNTY—Pyle & Sutter's Lindstrum 1, se ne 9-25-4e, d 3400 ft. Wakefield & Osborne's Osborne 1, nw ne 18-30-3e, d 1145 ft.

EDWARDS COUNTY — Amerada-Wilcox's Teansil 1, nw cor 32-25-19w, d 4475 ft. British-American Oil Co.'s McCarty 1, ne nw 31-25-17w, d 3155.

DICKINSON COUNTY—T. C. Johnson's Detweiler 1, swc ne nw 32-16-4e, spd and sd.

ELLIS COUNTY—Rush Oil Co.'s Gatewood 1, nw 4-15-20w, sd 1100 ft. Finney & Weimer's Freeman 1, nw se se 24-15-20w, spd and sd. Brown's Gestner 1, nw se nw 13-13-18w, d

Reid

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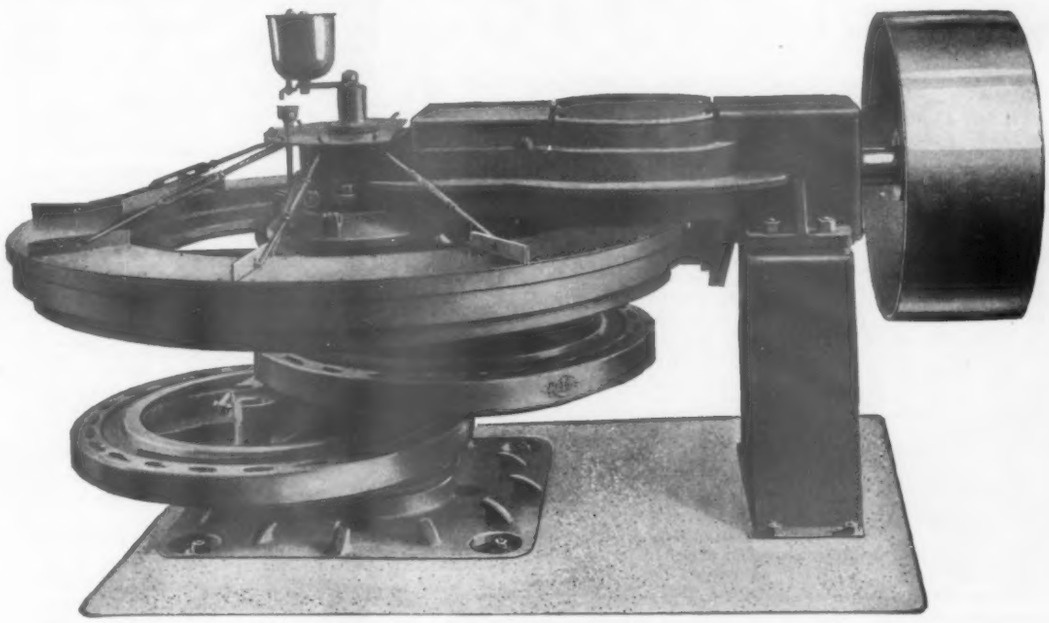

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1350 ft. Empire's Wann 1, ne 31-12-19w, d 3900 ft. Brouck's Wagner 1, c se se 35-15-16w, sd 2790 ft. Phillips' Brull 1, c nw 34-14-17w, d 3769 ft. Phillips' Schmeidler 1, nw cor 20-12-17w, d 2155 ft. Labette Oil Co.'s Urbank 1, ne nw nw 19-15-16w, d 3815 ft. Cosby et al's Robbins 1, sw nw 15-14-16w, ru. Phillips' Johnson 1, sw ne 9-13-19w, d 1375 ft. Phillips' Dechant 1, ne se 12-13-16w, d 200 ft.

GREENWOOD COUNTY—P. H. Balieu's Bright 1, ne sw 22-27-1e, sd 1210 ft.

GEARY COUNTY—Wright et al's Younkers 1, 17-11-5e, sd 1200 ft.

HARPER COUNTY—Amerada's Mendiville 1, c se se 24-34-6w, d 4276 ft.

HARVEY COUNTY—Margaret Gay Oil Co.'s Grouse 1, nw ne nw 29-33-1w, sd 2100 ft. Helmerick & Payne Lindamood 1, c sw ne sw 2-22-1e, sd 2185. Empire's Tangeman 1, c sw ne ne 19-22-1e, d 2775 ft. R. F. Garland's Cox 1, ne cor 27-24-1w, d 3070 ft. Austin's Neiman 1, swc 21-24-2e, hfw 3408-13, d 3413. Hartman & Skaer & White Eagle's Seaman 1, cnw ne se, 26-24-1e, rig. Roth & Fauret's Bombrowsky 1, iwc 26-22-1e, ru. Jolly & Ogg's Randall 1, nec 11-24-1w, d 1705 ft. Patton et al's Buning 1, cse sw ne 18-24-1e, ru. Jolly & Ogg's Hupp 1, se ne 22-23-1w, r.o.g. Fisher & Lanck's Regier 1, nw ne 17-23-2e, d 2585 ft.

JEFFERSON COUNTY—Wichita Oil Co.'s Simpson 1, nw sw sw 19-10-17e, ru and sd.

LANE COUNTY—Blankenship Pet. Co.'s Shaeffer 1, nec ne 24-16-28w, spd and sd.

MARION COUNTY—Connell & Prairie's Zirak 1, se sw 3-18-3e, d 410. Meyer's Papp 1, sw ne 10-18-2e, spd. Hartman & Skaer & White Eagle's Kline 1, ne nw 28-12-3e, d 2230 ft. Hanna's Pankratz 1, ne ne sw 13-20-3e, rig.

MARSHALL COUNTY—Irwin et al's Cooper 1, ne nw 10-3-7e, spd.

MORRIS COUNTY—Hiatt et al's Blythe 1, nw ne 35-15-5e, spd.

McPHERSON COUNTY—Ted Washabaugh's Vosshell 1, ne ne 9-21-3w, d 2735 ft. Lariaux et al's Martinan 1, ne se 9-19-3w, rig. Mid Kansas' Yoder 1, c nw sw 8-20-4w, 4 3135 ft. Helmerich & Payne's Rusen 1, c ne se sw 23-21-2w, spr.

NESS COUNTY—Barnsdall's Lauck 1, c sw 35-18-21w, d 3060 ft.

OTTAWA COUNTY—Anderson et al's Bank 1, ne nw 28-10-2w, re-build rig.

OSBORNE COUNTY—Jarvis Jellison 1, sec 13-10-15w, sd 1300 ft.

PAWNEE COUNTY—F. C. Troupe's Lovett 1, cel ne ne 31-21-16w, sd 1560 ft.

PHILLIPS COUNTY—Watsonian Oil Co.'s Marklein 1, ne sw 21-3-19w, d 3895 ft. Watsonian & British-American's Weinman 1, c sw sw 34-2-19w, d 1130 ft.

RENO COUNTY—Perry et al's Oswald 1, ne c se 30-22-5w, ru.

RICE COUNTY—Allison & Fitzwilliams' Poland 1, ne sw ne 36-19-8w, cellar. Higgins & Steinbuble's Shurr 7, ne sw 21-20-10w, sd 1820 ft ½M gas.

PRATT COUNTY—Jones & O'Haver's Hunt 1, c sw nw 15-28-14w, spd and sd.

RUSH COUNTY—Danciger O. & R. Co.'s Pinonka 1, c ne sw ne 17-19-17w, d 900 ft. Sinclair's Beiching 1, nw ne nw 9-16-16w, ur 1-inch csg 3718 ft. Central Commercial's Brack 1, nec sw sw 12-17-16w, spd and sd. Phillips' Legleiter 1, c ne nw se 10-16-18w, d 1945 ft. Barnsdall's Brock 1, c se se 21-17-17w, rig. Danciger's Swindt 1, c sw se sw 22-17-17w ru. Wilcox O. & G. Co.'s Schwartzkopf 1, c ne nw sw 27-17-19w, rig.

SALINE COUNTY—M. Esty et al's Peterson 1, c ne 6-16-5w, spd and sd. Nathan-Jones et al's Robertson 1, nw sw 27-14-2w, d 3236 ft. Kenning Coastal Co.'s Beal 1, c 23-14-5w, rig.

SEDGWICK COUNTY—Magnolia's Wise 1, nwc 36-28-1w, d 2260 ft. Producers Oil Co.'s Jones 1, csw ne se 31-26-2e, ru. Barnsdall's Faber 1, sw ne 6-27-1w, d 3786 ft. Hawkin's Murfit 1, c sw 4-25-1w, rig. Morgan & Tilley's Fitzgerald 1, nw ne 5-26-1w, d 800 ft. Hartman & Skaer & Carter's Hitchinson 1, c se se sw 23-28-2w, spd. Slick's Rosenhagen 1, c sw se ne 33-27-4w, rig. Connell Oil Co.'s Cross 1, ne cor 27-25-1w, pb 2730 ft. Blankenship & Washoma's Tuttle 1, sw nw 1-27-1e, r.o.g. Morban et al's Corn 1, sw ne 28-25-1w, d 2980 ft. Kroder et al's Harder 1, sw nw sw 20-26-1e ru. Kyser et al's Stroot 1, sw nw 28-26-1w, d 2955 ft. Kayser et al's Stroot 1, sw nw 28-26-1w, d 2955 ft. H. H. Patton's Ryder 1, nec 22-25-1e, d 2655 ft. Jones & Kirk's Sheppard 1, se ne 4-25-1e, spd. Lario & Blair's Tjaden 1, c ne se 22-29-2w, co 2200 ft. Maglason's Buckles 1, nw se 3-28-1w, sd 250 ft. Ramsey's Schuessler 1, swc 1-25-1e, d 2510 ft. McCulloch et al's John 1, c ne sw ne 24-29-1e, sd 3520 ft. Miller & Wentz's Shaeffer 1, nw ne 9-27-2w, 12-inch csg 1257 ft. Lewis et al's Taylor 1, nw ne 23-27-2e, d 1900 ft. Shawrer et al's Reeves 1, c se sw se 19-28-1e, ur 8-inch csg 3100 ft. Austin Drlg. Co.'s Stuckey 1, sw nw 12-26-5w, bldg rig. Washabaugh'c Harrison 1, c nw ne ne 3-26-2w, spd. Hammond & Stout's Roeder 1, sw nw 23-27-2w, timbers. Connell & Slick's Mahannah 1, c ne se se 3-25-1w, spd. Sullivan et al's Shelly 1, c nw ne se 32-29-2e, spd. Reynold's & Rogers' Updegraft 1, c se sw se 26-25-1w, ru. Patton & Wentz's Swanson 1, nw ne 6-26-2e, rig. Tatlock et al's Cook 1, swc 23-28-2e, d 350 ft.

SHERMAN COUNTY—A. L. Henson et al's Murray 1, ne se nw 22-7-40w, sd 3035 ft.

SMITH COUNTY—Mid-Kansas's Lambert 1, nec 4-2s-13w, D 2510 ft.

STEPHENS COUNTY—W. Skidwell et al's Kelly 1, sw ne 16-34-38w, d 1310 ft. Trees Oil Co.'s unknown 1, sw ne sw 3-25-38w, fshg 430 ft. McKenna et al's Hamm 1, se ne 10-33-38w, bM gas, 2630-38 shut in.

SUMNER COUNTY—Gypsy's Williams 1, ne se sw 16-35-3w, fshg 4437 ft, 3M gas. Davidson et al's Strickland 1, sw se 12-35-1w, rig. Marland's Curry 1, nw sw 26-34-2e, ru.

TREGO COUNTY—Central Commercial Oil Co.'s Ellis 1, ne sw ne, 20-13-21w, sd 3300 ft.

WASHINGTON COUNTY—McCool & Vincent's Linn 1, nw ne 27-4-3e, ru.

ARKANSAS

ASHLEY COUNTY—Atlanta O. P. Co.'s Bledsoe 1, 20-15-7, wo 2554 ft. Texas Co.'s Keiffer 1, 11-18-4, sd rock waiting fuel, td 3332 ft.

CALHOUN COUNTY—Joe Harley's Ark. Land & Timber 1, 29-16-21, sd high water 3302 contract depth.

CLARK COUNTY—Wm. Henry Tr.'s Clark 1, 34-9-21, sd 1385 ft.

CRAWFORD COUNTY—Industrial O. & G. Co.'s Brownlee 2, 22-9-31, lcn.

COLUMBIA COUNTY—G. W. Dawley et al's Fullenwider & Kitchen 1, 12-17-22, sd wo 2847 ft. Helena O. & G. Co.'s Pickler 1, 19-19-22, dr 1405 (erroneously carried formerly Garland Co.)

CHICOT COUNTY—W. S. Smith's Meyer 1, 19-19-2, sd wo 850 ft. Joe Crawford's Cashion 1, 14-18-2, ds stuck 2330 ft.

DALLAS COUNTY—Robt. H. Dedman's Hillman 1, 20-10-13, temp abn, td 1145 ft.

DREW COUNTY—Ohio Oil Co.'s Jerome Lbr. Co. 1, 13-15-4, dr 2055 ft.

FAULKNER COUNTY—Gold Creek O. & G. Co.'s Sterner 1, 17-4-13 temp abn, td 3462 ft.

FRANKLIN COUNTY—Ozark Nat. Gas Co.'s McElroy 1, 15-8-27, lcn.

GARLAND COUNTY—H. H. Given's Garrett 1, 1-13-19w, dr 2968 ft. Chaywood Oil Co.'s Malvern Lbr. Co. 1, 17-2-17, wo 1665 ft.

GRANT COUNTY—Jones & Watkins' Meek 1, 5-4-11, sd 1400 ft.

JOHNSON COUNTY—Ark. Nat. Gas Corp's Bynum 2, 12-10-24, dr 2200 ft. McPherson 1, 10-10-24, dr 2625 ft.

LITTLE RIVER COUNTY—Grote et al's Allen 1, 21-12-13w, sd 2941 ft.

LOGAN COUNTY—Ark. La. Pipe Line Co.'s Hanna 1, 26-7-23, lcn. Ark. Nat. Gas Corp.'s W. H. Parks 1, 26-8-24, ur 5 3/16-inch csg 4370 ft.

MILLER COUNTY—E. A. Martin, Tr.'s Dale 4, 23-15-26, dr 3265 ft.

OUACHITA COUNTY—Little Fay Oil Co.'s Goodwin 1, 13-15-16, coring 2610 ft. McDonald Bros.'s Wilson 1, 25-15-18, swabbed several days showed small amt sw arr deepen, td 2823 ft. Charles McDonald's Wilson 1, 25-15-18, open hole 4 ft sand flowing by heads thru csg est 200 to 250 bbls 31 gravity oil. Faucher et al's Bucks 1, 7-15-17, cemtd 10-inch csg 62 ft.

ST. FRANCIS COUNTY—W. F. Harris' Halbert 1, 32-4-4, lcn.

UNION COUNTY—E. L. Foster et al's Smith 1, 8-16-17, waiting 10-inch csg 20 ft. La. Oil Ref. Corp's Manley 1, 15-15-19, tested 17 thribbles sw 2399 ft arr deepen. Frank Foster et al's McDonald 1, 11-17-18, dr 2320 ft. Foster et al's Murphy Land Co. 1, 22-17-17, sd 1400 ft. J. O. Moore Tr.'s Union Sawmill 1, 11-18-22, dr rock 1350 ft. Carter Bell et al's Terrell 1, 27-18-14, sd 2594 ft. J. P. Hawkins et al's Goodwin 1, 6-17-15, sd 1204 ft. McDonald Bros.' Mayfield 1, 29-19-15, sd wo 1990 ft. Frazier et al's Laney 1, 30-19-16, lcn abn will not drill. Standard Oil Co. of La.'s J. R. Burns 5, 31-17-15, dry at 2207 ft. Goodwin 6, 36-17-16, drk. Grimes Bros.' Hill 2, 7-8-14, rig up wo. J. C. Marcum's DeYambert 1, 5-19-4, dr 3215 ft. Gulf Ref. Co.'s Rosa L. Cook 1, 1-18-15, lcn. W. M. Coats Tr.'s McDuffie 1, 32-19-16, lcn. J. W. Olvey's Cottrell 1, 22-17-17, drk, pat.

NORTHERN CALIFORNIA

KERN COUNTY

BELRIDGE—H. J. Bardwell's 1, 24-28-20, produced few bbls heavy oil on test, td 1000 ft.

BUTTONWILLOW—Richfield's Kerwin 1, bailing through 3-inch cas, td 5210 ft; Redding 1, 36-27-23, dr shale 3775 ft, gas showings.

EDISON—Symark Oil Co.'s 1, 24-29-29, installing rotary, td 1190 ft.

GOULD HILLS—Bomka & Ball's Larson 1, 19-29-20, dr shale 2360 ft. Ozena Oil Co.'s 1, washing over 3-inch drill pipe 2930 ft.

McFARLAND—General Pet. Corp.'s KCL-1, 25-26-25, new lcn.

McKITTRICK—The Texas Co.'s Aldridge 1, 4-30-22, dr shale 4035 ft.

ROSEDALE—Elmer Oil Co.'s 1, 33-29-26, new lcn.

SHALE HILLS—Day Oil Co.'s 1, 1-27-18, will deepen from 600 ft. Wm. Gilbert's 1, 35-26-18, wil deepen from 750 ft.

SAN EMIDIO—Union's KCL-2, 5-10-21, dr 1500 ft.

SANTA BARBARA COUNTY

CARPENTERIA—Continental's Franklin 1, trying to make production test through tubing, td 3990 ft.

GELETA—Shell's Rutherford 1, 36-5-31, sr 2400 ft.

POINT CONSEPCION—Standard's Gerber 1, dr shale and sand 1075 ft.

SANTA BARBARA—Channell Oil and Development Co.'s Fellowship 1, 29-4-27, rigging rotary. Exeter Oil Co.'s Duncan Ranch 1, dr 1200 ft; Dos Pueblos 1, 8-4-29, dr 300 ft. Bankline Oil Co.'s Duncan Ranch 1, dr shale 3250 ft. Olympic Oil and Refining Co.'s Palisades 1, 29-4-27, dr shale and hard sand 700 ft.

SUMMERLAND—American Oil Producers' Submarine 1, rigging rotary.

TEPUSQUET—Tepusquet Oil Co.'s 1, 3-9-32, sd 2710 ft.

TORTUGA CANYON—Standard's Schyvers 1, dr hard sand 1535 ft.

VENTURA COUNTY

CAMARILLO—American Oil Co.'s 1, 33-2-20, dr basalt 865 ft.

CONEJO—Triunfo Oil Co.'s 1, 24-1-19, dr 825 ft.

FILLMORE—Frank Oil Co.'s 1, 35-4-20, dr sand 200 ft. Federal Oil Co.'s Elkins 1, 5-3-19, 8⅝-in cas cemt 2850 ft.

HUENEME—Texas Co.'s Eastwood 1, new lcn.

OJAI—R. E. Burke's McDonnell 1, 11-4-23, sd 2840 ft. Continental's Fox 1-M, 21-4-22, co 3720 ft; Thompson 1-A, dr brown shale 5885 ft. Miley Oil Co.'s Casitas 2-A, 12-3-24, dr red sand 915 ft.

PIRU—Pacific Western Oil Co.'s Tehemescal 5, 3-4-28, flowing oil.

SANTA PAULA—W. W. Bryant's Anlauf 3, 21-4-21, sr brown shale 835 ft. Empire Oil Co.'s 1, 13-4-21, rig. San Pedro-Pt. Fermin Synd.'s Kellerman 1, 13-4-21, sr 700 ft.

SATICOY—Standard's Citrus 5, 10-2-22, dr gray sand 4925 ft.

SESPE—Texas Co.'s McGuire 1, 2-3-19, rig.

SIMI—Shell's Marr 1, 31-3-17, coring and sr 2255 ft.

SOUTH MOUNTAIN—F. A. Craise's S-1 ,nw¼ 17-3-20, new lcn. Ring Pet. Corp.'s Converse 1, 23-3-21, co 4840 ft.

MISCELLANEOUS

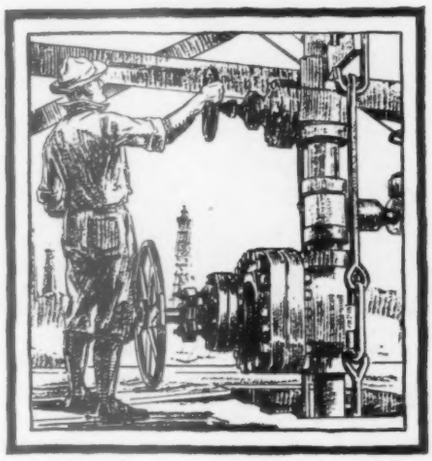
MERCED COUNTY—Applegate and Renshaw's 1, 24-6-10, dr shale 2775 ft. H. L. Kuhn's 3, 8-12-19, lcn.

MONTEREY COUNTY—Shell's Dudley 1, 15-22-9, dr 920 ft.

SAN LUIS OBISPO COUNTY—L. E. Bering's 1, 13-32-22, dr brown shale 485 ft. Dollar Oil Co.'s H-K 1, 18-31-22, new lcn; Phelps 1,

Tested in the factory

Proven in the field



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DARLING
GATE VALVES

18-31-22, lcn; No. 1, 7-32-22, dr gray sand 1200 ft. Keefe-Morrison's Phelps 1, 18-31-22, co 1525 ft. John Knudsen's Schmidt 1, 12-32-22, dr shale 225 ft. Lincoln Drilling Co.'s 1, 18-32-23, dr brown shale 775 ft. North Star Oil Co.'s 1, dr 3242 ft. Panorama Oil Co.'s 1, 7-31-21, stdtr ur lug 3430 ft. Premo Oil Synd.'s 1, 5-32-13, new rig. T. H. Purman's 1, 12-32-22, dr brown shale 1875 ft. Texas Pacific Coal and Oil Co.'s Dutton 1, 25-32-14, fsh 900 ft. Union's Russ 1, re-dr 3165 ft; Chandler 1, 12-32-15, sr and co 2900 ft. Western Drilling and Producing Co.'s 1, 2-32-22, dr 25 0ft.

TULARE COUNTY—Angiola Development Co.'s 1, 227-22-23, dr gray sand 5240 ft. Big Four Drilling Co.'s 1, 29-23-27, fsh for 4½-inch cas, td 4330 ft.

SOUTHERN CALIFORNIA

ATHENS-ROSECRANS — Burlingame Pet. Corp.'s Hamm 1, sd 320 ft.

CHATSWORTH—Russell Pet. Co.'s Joughin 2, dr sandy shale 1250 ft.

COSTA MESA—Mesa Pet. Corp.'s B. A. 1, dr hard sand 3725 ft.

DOWNEY—Rio Grande Oil Co.'s Osborne 1, dr hard sand 4522 ft.

FULLERTON—Shell's Stern 1, coring sand 6575 ft.

GARDEN GROVE—The Texas Co.'s Crawford 1, dr shale 4230 ft.

HUNTINGTON BEACH—Western Drilling and Producing Co.'s Iuskeep 1, sd 4460 ft.

INGLEWOOD—California-Eastern Oil Co.'s Pollard 1, 8¼-inch cas cmt 4150 ft, td 4175 ft. Max Pray's 1, Prairie and Aerick Avenues, new lcn. John A. Woodward, Jr.'s 1, dr sand and shale 3422 ft.

LOS NIETOS—R. W. Jackson's 1, dr 275 ft.

MANHATTAN BEACH—Western Drilling and Prod. Co.'s 1, dr sand 3535 ft.

MAYWOOD—Richfield's Vernon 1, dr gray sand 5160 ft.

NEWHALL—California Eastern's Hasley 1, trying for water shutoff, td 3210 ft.

POMONA—Pomona Oil and Gas Assn's Comm. 1, fsh 975 ft.

PUENTE—Richfield's Didier 1, dr oil sand 3650 ft.

TELEGRAPH CANYON—Union Oil Co.'s Rimpau 1, new lcn.

VENICE—Ohio Oil Co.'s 1, NW¼ 22-2-15, new lcn.

RIVERSIDE—Hemet Pet. Co.'s Ward 1, trying for water shutoff, td 3230 ft. Trabuca Oil Co.'s 1, dr 3650 ft.

SAN BERNARDINO COUNTY—Mahala Oil and Gas Co.'s 1, rigging compressor.

SAN DIEGO COUNTY—Western Pacific's 3, 4¼-inch cas cmt 3370 ft. S. S. Turner's Baler 1, dr 1735 ft.

NORTH LOUISIANA

BIENVILLE PARISH—W. P. Wallace's State 1, 16-16-10, cemtd 6-inch csg 2485 ft.

BOSSIER PARISH—Big Ben Oil Co.'s Stewart 2, 15-18-12, sd wo 1300 ft. Nell & Lanier's Biedenharn 1, 23-21-14, sd 50 ft. Walker et al's Antrim 1, 28-22-14, sd 2985 ft. John F. Woodman's Bolinger 1, 9-22-11, dr 2060 ft. Magnolia Pet. Co.'s B. M. Cook 1, 2-22-11, tested show gas and sw 2693 ft coring 2703 ft. Sallie Coyle 1, 2-22-11, drk.

CADDO PARISH—D. C. Oil Co.'s Hunter Est. 1, 17-19-14, sd wo 2017 ft.

CATAHOULA PARISH—Lochnager O. & G. Co.'s Taliaferro 1, 26-9-6e, sd 900 ft.

CLAIBORNE PARISH—Smitherman & McDonald's Miller 1, 17-23-8, sd wo 4780 ft. El Dorado Chief Oil Co.'s Baker 1, 26-20-7, coring snd 2940 ft.

DESOTO PARISH—Benedum & Trees' Mahoney 1, 24-14-12, dr 1800 ft. Nicholson 1, 2-15-14, dr 1800 ft. P. J. Becker's Tull 1, 23-15-12, moving in rig. Benson O. & G. Co.'s Jackson 1, 3-10-13, rig up. Luke Case Tr.'s Boatright 1, 3-10-13, dr 2800 ft. R. O. Roy's Sample 1, 1-13-14, sd wo 2310 ft. Thorn Oil Co.'s Burford 1, 22-14-14, sd 3020 ft. Longstreet Synd.'s Ramsey 1, 33-13-16, fshg csg 2802 ft. DeSoto Synd.'s Holmes 1, 20-13-16, dr 1500 ft. Williams 1, 29-13-16, dr 800 ft.

EAST CARROLL PARISH—Palmer Corp.'s O'Brien 2, 6-19-11e, rig up.

FRANKLIN PARISH—Davis et al's Moore 1, 12-11-6e, sd wo 1430 ft.

GRANT PARISH—Carter & Collins' Ball Lbr. Co. 1, 29-7-1w, sd wo 2010 ft. Tannehill & Hardtner 1, 9-6-1w, sp.

LINCOLN PARISH—V. E. Shaw's Voss 1, 1-20-3w, 8-inch csg to test gas show 915 ft.

MOREHOUSE PARISH—Rainbow Oil Co.'s Louisville Cooperage 1, 33-22-8e, drk. Woodley & Collins' Harp 1, 22-22-7e, r 2484 ft.

NATCHITOCHES PARISH—Robeline O. & G. Co.'s Cassady 1, 7-8-9w, sd reprg rig, td 2700 ft. S. D. McDaniels' Morse-Clarke Lbr. Co. 2, 23-5-6w, dr 1350 ft.

OUACHITA PARISH—Ouachita Nat. Gas Corp.'s D'Arbonne B-2, 25-19-2e, sd 3349 ft. Phillips et al's School Fee 1, dr 3160 ft.

RAPIDES PARISH—G. E. Silbertson's Willemach 3, 13-5n-4w, 2250 ft. Glenmora Pet. Co.'s Fee 1, 1-2n-2w, sd 3850 ft.

RICHLAND PARISH—Richland Operating Co.'s S. R. Humble 1, 30-16-7e, dr 1230 ft. S. C. Wilson's Buie 1, 17-15-7, dr 1115 ft.

SABINE PARISH—R. L. Gay, Tr.'s Bowman-Hicks 2, 14-7-14, dr 2560 ft. Sabine Lbr. Co. 1, 13-7-14, dr 2738 ft. Long-Bell Lbr. Co. 1, 26-8-14, drk. W. J. Garnier's Bowman-Hicks 1, 16-7-12, sd 625 ft.

TENSAS PARISH—Enochs et al's Curry 1, 39-11-12e, sd 3583 ft.

UNION PARISH—Sundby et al's Security Trust 1, 6-23-1e, sd wo 2100 ft. G. E. Carmatte's Tugwell 2, 21-22-1e, sd wo after coring oil sand, td 1845 ft. Carter & Wingfield's Clark A-3, 8-23-1e, drk; Hudson 2, 7-23-1e, sd wo 2278 ft; Hudson 3, 7-23-1e, sd wo 2278 ft; Security Trust 2, 7-23-1e, lcn. H. C. McDonald's Union Sawmill 2, 18-23-1e, sd 1500 ft.

WEBSTER PARISH—P. Hudson's Slack 1, 1-22-11, dr 480 ft. Nemours Corp.'s 2, 1-22-10, dr plug 2610 ft. J. W. Clark, Tr's Mayfield 2, 20-23-9, 600 ft oil in hole 4 ft snd will pump, td 2767 ft. Magnolia's Pet. Co.'s Atkins 1, 4-22-9, lcn; Denman 1, 1-22-11, cemtd 5¾-inch csg, td 2715 ft. Harry Morris' Lewis 1, 15-23-9, sd wo 2902 ft. F. Woodman's Boyd 1, 3-22-11, drk.

EAST TEXAS

BOGGY CREEK (Anderson-Cherokee Counties.)—Humble's Neches River 1, dr 3555 ft chalk; Lizzie Smith 3, preparing to pump; T. H. Jones B-1, dr 3559 ft sand; Gouger 1, dr 2983 ft chalk; Purvey 1, dr 2310 ft sticky shale; Earl & Ragsdale 4, waiting on cement to set at 3551 ft; Elliott-Clark B-1, dr 1700 ft sticky shale.

BOWIE COUNTY—Hooks O. & G. Co.'s Rosenberg 1, King sur, temp abn, td 3086 ft.

CAMP COUNTY—Rogers et al's Enfelt 1, Montgomery sur, sd 1920 ft.

CASS COUNTY—Davis & Pigg's Ed Lambert 1, Lambert sur, sd wo 1952 ft.

MARION COUNTY—Trimount Pet. Co.'s Mebane-Stiles A-1, Gupton sur, dr 1958 ft.

RED RIVER COUNTY—D. M. Buffington's Hoosier 1, Hughart sur, sd 1565 ft. Shad Harper's Garland 1, Jos. Wagley sur, sd wo 1862 ft. Johnson Pet. Co.'s Randolph 2, Dean sur, sd wo 1440 ft.

SHELBY COUNTY—Chapparal Oil Co.'s Holt 2, Matthew Moore sur, sd 3004 ft. Gulf Ref. Co.'s Caraway 1, Patterson sur, coring hard blue shale streaks lime 3250 ft.

SOUTHWEST TEXAS

BASTROP COUNTY—Livingston et al's McCall 1, wo, 1 mi s Bastrop, cored 1200 ft, oil show. Owens et al's White 1, 2 mi w Cedar Creek, sd 382 ft; Goodman 1, 1½ mi from Cedar Creek, dr chalk 1930 ft.

CALDWELL COUNTY—Shell's Wilhms 1, Jolly district, temp abn, lcn. Alexander-Smith's Gomillion 1, 10 mi n Lockhart, dr 1650 ft chalk. Anderson et al's J. P. Horner 1, dr 1020 ft shale. Cranfill & Reynolds' W. P. Smith 1, Lytton Springs, dr 1560 ft chalk. Adams & Lyle's Branyon 1, dr Edwards lime 2342 ft. Detex Oil Co.'s Robinett 1, dr 1200 ft shale.

DUVAL COUNTY—O. Henry Oil Co.'s Hnery 7, r 1758 ft. W. F. Morgan's Welder Wood 1, sur 102. dr 100 ft.

GONZALES COUNTY—Greene et al's Dix 1, sw part of county, depth 665 ft. Linderman Bros.' Frampton 1, 1 mi n Waelder, lcn. Benedum Trees' J. L. Lamkin 1, 1 mi n Ottine, ru. Flynn et al's Wilhouser 1, sw part of county, sd 5212 ft. Empire G. & F. Co.'s San Marcos River State 1, Ottine area, dr 3922 ft chalk. Indiana Pet. Corp.'s Karnstadt 1, Ottine area, dr 4025 ft Taylor marl. Joe Bruner's Miller 1, 1 mi n Waelder, dr 475 ft shale. Crown Pet. Co.'s Hattenbach 1, southern part of county, drk.

GUADALUPE sCOUNTY—Christie et al' Thomas 1, near Prairie Lea, sd 1230 ft. Sights et al's Woehler 1, 4 mi e Seguin, cor 2035 ft. Miller Bros.' Springs 1, 5 mi s Seguin, dr 2316 ft lime. Trinity Drillers' Church Land 1, Kingsbury 1, dr 2042 ft chalk. Adams Lyle's Lambrecht 1, 6 mi s Seguin, dr 1400 ft shale.

MAVERICK COUNTY—Rycade Oil Corp.'s Chittim 4, 20 mi e Eagle Pass, dr 410 ft. Chittim 3, 20 mi e Eagle Pass, prep to deepen from 3204 ft; Sullivan 4, Ryan Consolidated Pet. Corp.'s Indio Co. 2, 24 mi se Eagle Pass.

STARR COUNTY—The Texas Co.'s Virginia Guerra 1, dr 188 ft.

WEBB COUNTY—The Texas Co.'s Weeks & Wilder 1, Sec. 683, near Carolina-Tex pool, r 3071 ft.

TEXAS GULF COAST

Completions

COLORADO COUNTY—		
The Texas Co., Kveton 1, Cat Sprgs	*	1500
HARRIS COUNTY—		
South Texas Pet. Co., Hicks 1, Almeda	*	4420
REFUGIO COUNTY—		
Davidson-Horn's Howard 1, 3 mi sw Refugio field	*	3020

AUSTIN COUNTY—Humble's R. Dietrich 2, Raccoon Bend, dr 2684 ft sand and lignite; Snell 1, Boggy Creek, lcn; Washington B-1, Raccoon Bend, lcn; Hardy 3, Raccoon Bend, dr 1142 ft sandy lime; Hardy 4, lcn; Buchanan 1, Raccoon Bend, dr 150 ft shale; E. Washington A-2, Raccoon Bend, ru; A. Grawunder C-1, Raccoon Bend, setting up pumping unit; Sherrill 1, Raccoon Bend, dr 3098 ft sandy shale; Wilson Heirs 1, Raccoon Bend, dr 459 ft shale; Mueller 1, Raccoon Bend, dr 213 ft hard sand; Urban 2, Raccoon Bend, standing; Urban 3, Raccoon Bend, dr 2789 ft sand and shale; Roy Thompson 3, Raccoon Bend, set cas at 1233 ft; J. W. Wilson 1, Raccoon Bend, set cas at 2680 ft, prep to dr plug; E. Kearns 2, Raccoon Bend, dr 3222 ft shale; E. B. Wilson 3, Raccoon Bend, aban at 1078 ft; E. B. Wilson 4, Raccoon Bend, ru; E. Grawunder D-1, Raccoon Bend, dr 1252 ft sand and boulders; Sanders 2, Raccoon Bend, dr 955 ft hard sandy lime. Flanagan & Mewis' Mewis 1, between Raccoon Bend and Bellville, ru.

BRAZORIA COUNTY—Meyer et al's Davidson 2, Clemens Dome, abn at 950 ft. Shell Pet. Corp.'s Reese 3, Allen Dome, prep to abn at 5121 ft, salt. Mumphreys Corp.'s Bryan 1, Bryan Heights, dr 2306 ft shale. Empire G. & F. Co.'s Brock 2, Stratton Ridge, abn 3700 ft.

CALHOUN COUNTY—Baker & Thompson's Thomas 1, 9 mi w Pt. Lavaca, cleaning out hole, 2650 ft.

CHAMBERS COUNTY—Pure Oil Co.'s Mayes 1, Lost Lake, depth 2070 ft, waiting on cement to set over oil showing sand; Lost Lake 2, Los Lake, abn at 4192 ft in anhydrite. Gulf's Wilborn 1, Hankamer, dr 5250 ft shale and lime. Mills Bennett Prod. Co.'s Smith 2, Barbers Hill, e side, dr 1750 ft gbo; E. W. Barber 1, ne side Barbers Hill, dr -569 ft; Kirby 2, Barbers Hill, e side, milled out of cas at 5058 ft. Mills Bennett-Republic Prod. Co.'s Means 1, Barbers Hill, e side, dr 4778 ft sandy lime. Humphreys Corp.'s Kirby B-6, Barbers Hill, e side, trying to sdtr. Sun Oil Co.'s Chambers Co. Agricul. Assn. 1, sw side Barbers Hill, dr 3948 ft gbo. Gulf's Fisher 1, Barbers Hill, sw side, dr 4718 ft shale and lime. Mike Kouri's Shaw 1, Barbers Hill, e side, prep to pump, 2070 ft; Shaw 2, Barbers Hill, lcn. Joe Bashara's Tarbutton 1, Barbers Hill, e side, set cas at 5070 ft, td 5157 ft. Carpenter & Eunice's Feldman 1, e side Barbers Hill, drk; Tolbert et al's Ilfrey 1, Barbers Hill, lcn. Yount-Lee Oil Co.'s Chambers Co. Agricul. Co. 2, Barbers Hill, sw side, dr 5170 ft sand and shale; Chambers Co. Agricul. Assn. 3, Barbers Hill, dr 4860 ft sand and lime. Richardson 4, Barbers Hill, sw side, dr 2188 ft sand rock.

COLORADO COUNTY—The Texas Co.'s Kveton 1, Cat Springs, abn at 1500 ft; Kinkler 1, lcn. Shell Pet. Corp.'s Neundorff 1, 1 mi ne Bernado, dr 970 ft gbo. Humble's Binkley 1, Altair, spudded. Merrett et al's Zverck 1, 2 mi e Ellinger, sd 320 ft.

FAYETTE COUNTY—Phalen et al's Cer-

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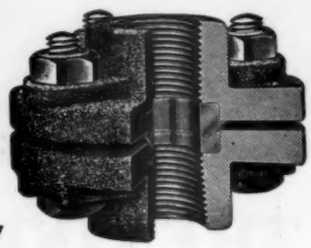

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vanca 1, 6 mi s La Grange, dr 3700 ft lime. Moore et al's Kerr 1, Muldoon, sd 2080 ft. National Oil Co.'s Melcher 1, plum, dr 2490 ft shale.

FORT BEND COUNTY—Sun Oil Co.'s E. C. Farmer 4, Boling, depth 3895 ft; H. R. Farmer 4, Boling, drk. Rodgers 2, Boling, dr 4144 ft sand and shale. The Texas Co.'s Dippel B-1, Boling, waiting on cement to set 3711 ft; Dippel A-1, Boling, abn at 3983 ft heaving shale; Pleasants 1, Boling, dr 1442 ft hard sand; E. C. Farmer 2, Boling, dr 3372 ft shale and lime; Wheat 4, Big Creek, abn 3643 ft. Gulf's Moore 18, Moore's Field, dr 3500 ft sand and lime; Wolf 14, Long Point, abn at 650 ft; Trone 11, Long Point, lcn. Boling Dome Oil Corp.'s Armstrong 1, Boling, coring and drilling hard sand at 4525 ft. Humble's Brazos Farm 2, Sugarland, set cas over oil sand at 3240 ft td; Brazos Farm 3, Sugarland, r to set cas at 3206 ft; Brazos Farm 4, Sugarland, dr 1670 ft sticky shale; Brazos Farm 5, Sugarland, dr 988 ft gbo; Sugarland Industries 5, Sugarland, set cas over oil sand, depth 3547 ft; Sugarland Industries 6, Sugarland, dr 2190 ft shale and lime; Deathridge 2, Sugarland; Nelson 2, Sugarland, dr 1098 ft rock; Camp 2, Sugarland, completed for 1500 barrels at 3600 ft; Bankers Mtge. 1, Sugarland, dr 2860 ft sandy shale. South Tex. Exploration Co.'s Hartfield 1, Needville, dr 6390 ft lime rock.

GALVESTON COUNTY—Long et al's Irvin & Bishop 1, 2 mi s Dickinson, sd 4322 ft. Republic Prod. Co.'s Lobit 1, 1 mi nw Dickinson, dr 4440 ft shale. Republic Prod. Co.'s Lobit 1, 1 mi nw Dickinson, dr 4440 ft shale.

GOLIAD COUNTY—Booth & McCarson's Murry 1, B 11, R 3, Goliad, dr 1350 ft lime. Alexander et al's Frame 1, 8 mi n Goliad, depth 725 ft.

HARDIN COUNTY—Guedry Drlg. Co.'s Guedry 1, 3 mi s Batson, drk.

HARRIS COUNTY—Torsen et al's Stewart 1, 4 mi sw Genoa, sd 691 ft. Hunt et al's Lobit 1, 4 mi n Goose Creek sd 2145 ft. Humble's Simms-Smith 75, Goose Creek, dr 3746 ft sand and bldrs; Warren 5, Hockley, dr 3178 ft shale; Minnetex 1, Mykawa, dr 5811 ft shale. Little York Oil Co.'s Davis 1, Little York, dr 2410 ft sand and shale. Paxton et al's Brubacker 1, 1 mi ne Clodine, sd 1125 ft. Paxton & Pundt's Brown 1, ru. South Tex. Pet. Co.'s Hicks-Higbee 1, near Almeda, abn 4415 ft; Morris 3, se part of Humble field, set screen in oil show at 4780 ft. The Texas Co.'s House 22, Humble, dr 4436 ft sand showing oil; Stevenson 39, Humble, dr 4123 ft hard shale. Brains et al's Lentze 1, 4 mi s Tom Ball, sd 1120 ft. Baldwin & Neyland's Kitzman 1, 2 mi n Cypress, slight oil show in limy shale core at 3656 ft.

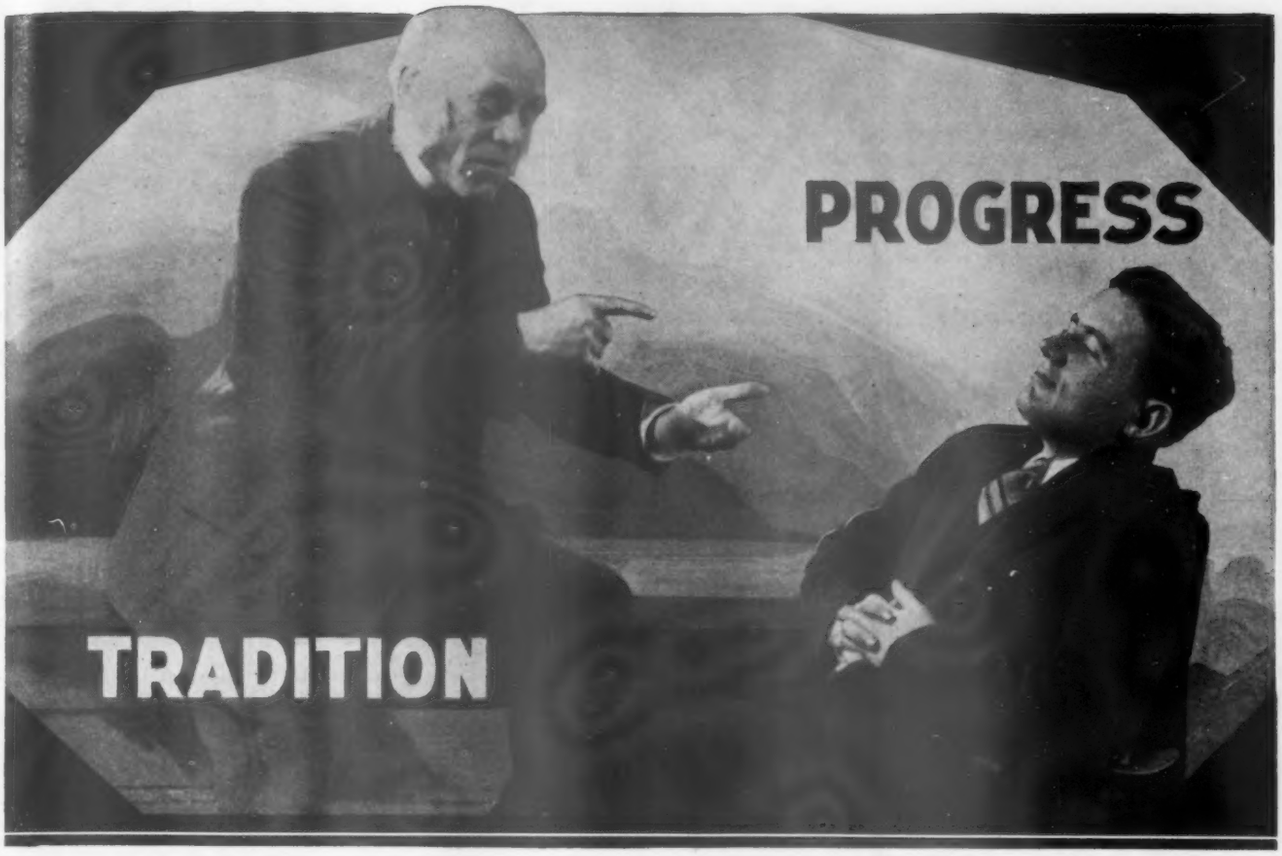
JACKSON COUNTY—The Texas Co.'s Moore 1, Edna, dr 3375 ft gbo. Wright Bros.' Drushell 8, Edna, drk; Classen 2, Edna, sd 3945 ft.

JEFFERSON COUNTY—Deep Test Oil Corp.'s Faith McFaddin 1, 1¼ mi e of Spindle Top production, set cas at 3460 ft, td 3500 ft. J. W. Farhar et al's Rohwedder 1, 5 mi ne Beaumont, dr 2765 ft sand and gbo. Beaumont Oil Co.'s Tyrrell 1, 2 mi w Brooks, drk. Gulf's Thomas 11, Fannett, dr 2420 ft shale and lime; Bordages A-7, set cas at 1200 ft. River Oil Co.'s Ship Channel Ld. Co. 1, 2 mi se Beaumont, dr 1320 ft sand. Bleakie Oil Co.'s Tollivar 1, 2½ mi nw Voth, depth 1560 ft, will set screen. The Texas Co.'s Pipkin & Davis No. 1, Big Hill, r 4975 ft. Yount-Lee Oil Co.'s Nona Mills 1, 5 mi s Beaumont, dr 3660 ft water sand.

LAVACA COUNTY—The Texas Co.'s Russeck 1, 6 mi s Ezell, dr 3749 ft sticky shale.

LIBERTY COUNTY—Barlow et al's Hinchdliff 1, 2½ mi ne Cleveland, sd 2215 ft. Kouri et al's Campbell 1, 6 mi s Cleveland, sd 2000 ft. Big Dome Interests' Finley 2, 3 mi nw Hardin, drk. The Texas Co.'s Davis 2, Davis Hill, dr 3235 ft shale and lime; Pickett 3, n end S. Liberty, dr 4300 ft sand and shale; Green 5, S. Liberty, ru. Humble's Sterling 4, Moss Bluff, dr 1478 ft gbo. Sun Oil Co.'s Kovelika 1, N. Dayton, abn 4680 ft. Union Explo. Co.'s Esperson 2, 2 mi s Sheeks, dr 3930 ft sand and shale. Tan Bay Oil Co.'s Christian 1, 10 mi n Hardin, sd 1115 ft. Republic Prod. Co.'s Mysilvec 1, 2 mi s Hardin, drk.

MATAGORDA COUNTY—Crossland et al's Crossland et al's Hawkins 1, Shepherds Mott, dr 3850 ft shale and lime. Rycade Oil Corp's



"Here, Lad—

You've been telling me that the Lincoln people were FIRST to build an arc welder, FIRST to apply arc welding to buildings, bridges, etc.

Now here I read the ad of another company saying they were responsible for the advent of arc welding.

Now, *both* can't be right."

"Sure, Pop—

every man who had an eye on or a hand in arc welding in the pioneering days—now says 'I told you so' and that makes him a pioneer.

What I told you about Lincoln FIRSTS are facts of record, but that's relatively unimportant.

The important point is

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— by reason of that interest being more intense (arc welders being their specialty)

— by reason of Lincoln's wide-spread development work with manufacturers in hundreds of fields

a much better machine has been built than could have been the case with lesser qualifications.

That's why I won't argue about pioneering.

I'd be glad to class everyone immediately following Lincoln as a pioneer even if he only attracted attention to arc welding and in this sense I'd even class Doc Cook as a polar pioneer."

The Lincoln "Stable-Arc" Welder

— welds easier
— makes better welds
— permits greater output

because of the steady uniform arc throughout entire welding range, which is the result of:

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Double control of welding heat
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No other welder has all these features.

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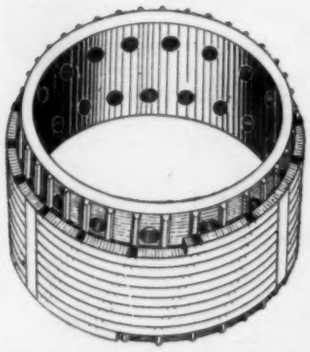

NOTE IN THE ILLUSTRATION that the entire area of the pipe is screening surface. This increased screening area reduces inlet velocity thereby reducing fluid friction and allowing greater volume of fluid flow through the screen at a given pressure in the well. This reduced velocity reduces sand cutting and gives longer life to the screen.

The outside diameter of the Stancliff Well Screen is less than the diameter of the couplings and can be set through any pipe that will pass the coupling.

Ribs on pipe allow .061 of an inch for oil circulation and permit free flowing of oil into pipe, after straining through the wires. The ribs strengthen the pipe as much as perforations have weakened it.

Square wire is used to give greater life without "sanding," because sand must cut through entire width of wire before affecting screen.

The square wire is lugged from top to bottom at regular intervals, uniformly spacing and bracing wire at bottom as well as top.

By varying spacing-lugs on wire, we make strainer to screen any size sand . . . on any size or kind of pipe desired.

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Manufacturers of
WELL SCREEN - PACKERS
SET SHOES - TONGS

Kuntze A 5, Markham, dr 2138 ft gbo. Dr. P. S. Griffith's Culver 1, e Citrus Grove, sd 3215 ft; Baer 1, 1½ mi n Gulf Hill, dr 2000 ft lime and gbo. West Prod. Co.'s Myers 1, Markham, dr 1120 ft.

ORANGE COUNTY—Veteran Oil Co.'s Reed 1, 2 mi se Orange field, dr 2540 ft. The Texas Co.'s Kuhn 1, 4 mi e Spindle Top, dr 1471 ft gbo.

REFUGIO COUNTY—Blanco Oil Co.'s St. John 1, 3 mi nw Refugio, dr 2555 ft shale. Davidson Horn's Howard 1, 3 mi sw Refugio, abn 3020 ft. Magnolia's Glenwinckle 1, 1 mi n Refugio field, dr 4200 ft shale. Houston Gulf Gas Co.'s Fannie Heard 7, Refugio, dr 940 ft.

VICTORIA COUNTY—Humble's Welder 3A, 1½ mi ne Nursery, dr 517 ft gbo.

WALLER COUNTY—Dixie O. & G. Co.'s Brazos River State 1, San Felipe, sd 500 ft. The Texas Co.'s Young 1, 3 mi e Raccoon Bend, dr 989 ft gbo and lime.

WASHINGTON COUNTY—Sun Oil Co.'s Schirmer 2, Clay Creek, drk; J. Grote 2, Clay Creek, coring at 2160 ft; Schlottman 1, Clay Creek, drk; G. Einman 2, Clay Creek, swabbed at 1260 ft; G. F. Grote 4, Clay Creek, lcn; G. F. Grote No. 6, Clay Creek, completed for 1000 bbls at 1225 ft; G. F. Grote 7, Clay Creek, lcn; Witte 2, Clay Creek, lcn. Davis et al's Seward 1, ½ mi n Independence, dr 1763 ft gbo. Thomas et al's Giddings 1, 4 mi e Brenham, lcn. Anderson et al's Rubenstein 1, 4 mi se Gay Hill, dr 200 ft shale.

WHARTON COUNTY—Hearte Oil Co.'s Brown 1, 3 mi s El Campo, sd 2145 ft.

MOUNTAIN STATES

WYOMING

BIG HORN—P. & R.'s 3, 24-56-98, sd 2709 ft. Prairie O. & G.'s Chilcote 1, 35-56n-95w, sd 2545 ft. P. & R.'s South Frannie 1, 7-57-97, prep to run pipe at 1950 ft. J. E. Scanlon et al's 1, 19-51n-92w, dr 2800 ft. Cody Pete.'s 1, sw 27-57n-96w, spd.

CARBON—P. & R.'s 2-19-88, sd 4003 ft.

FREMONT—P. & R.'s Muskrat 2, nw 1-33n-92w, location. Gates & Holamn, 6-33-94, no report. Kinney-Coastal 1, 22-3n-1w, dr 1365 ft.

HOT SPRINGS—Texas Prod. Co., sw 23-45n-100w, sd 1960 ft. MacPherson Oil Co., sw 2-44n-98w, set 5 3/16-inch and dr ahead 3317 ft.

LINCOLN—Midwest Refining Co., Waterfall 1, 35-22-115, dr 2605 ft.

PARK—California Exploration Co. and P. & R., Pitchfork 1, 12-48n-102w, cem 20-inch at 225 ft. Midwest, Rosenburg 36, 25-58-98, ur and co 1240 ft. Midwest, Kirk 1, se 23-58n-98w, stand cem 1497 ft. Cody Pete. Co., 1, ne 4-51n-102w, below 2800 ft. Oregon-Wyoming Oil Co., 30-52n-101w, resum dr at 1030 ft. Grebo-Royalties, 2-47n-100w, sd 1700 ft.

SWEETWATER—Mtn. Fuel Supply Co., Tucker 1, 18-13-99, sd 2480 ft. Mtn. Fuel Supply Co., Humphreys 1, 2-12-101, dr bel 2450 ft.

SUBLETTE—California Co., Wyss 1, 12-32n-115w, dr 1500 ft. California Co., Buchell 1, 11-29-115, sd 2505 ft.

UINTA—California Co., U. P. 1, 7-17-118w, dr 2909 ft.

WESTON—Continental Oil Co., 1, 11-45-64, will deepen from 1000 ft.

COLORADO

ARCHULETA—Juanita Oil Co.'s Harvey 1, sw 4-32n-3w, stand 735 ft, bad weather.

BENT—Marland Oil Co.'s Pipe Springs 1, se 27-29s-49w, sd 3987 ft.

ELBERT—Progressive O. & L. Co.'s Pease 1, sw 27-10s-60w, spdg 70 ft.

JACKSON—P. & R.'s State 1, ne 2-6n-81w, sd 1900 ft.

JEFFERSON—Ruby Hill O. & G. Co.'s Braden 1, se 14-4s-69w, 10-inch landed at 1139 ft.

LAS ANIMAS—Parker Club's Kinney-Coastal 1, se 4-28s-68w, dr 1422 ft. Oklahoma-Colorado O. & G. Co.'s Doherty 1, sw 32-34-60w, dr 655 ft.

LARIMER—Barrows et al., 7-11n-68w, sd 2000 ft.

LA PLATA—Royal P. & R. Co.'s Red Mesa 1, 27-33n-12w, sd 650 ft, bad roads.

LINCOLN—Kelley Oil Co.'s State 1, ne 36-14s-57w, sidetr bit, td 1542 ft.

MESA—Peerless Oil Co.'s Hoel 1, ne 23-8s-104, wtg 10-inch at 2058 ft. Parrish & Langston's D. & R.G. Western 1, nw 23-1s-1w, dr 210 ft.

MORGAN—Badger Creek O. & G. Co.'s Kent 1, sw 2-50n-10, sd 800 ft.

MOFFAT—Mtn. Fuel Supply Co.'s State 1, 16-12-100, fsg 3585 ft, td 3600 ft. McLaughlin et al's Wms. 1, 2-3n-91w, 8¼-inch cem at 2355 ft. McCormich et al's Sales 2, se 28-4n-92w, spd to 15 ft and sd.

MONTROSE—Uncompaghre O. & G. Co.'s Colorado Title & Trust Co. 1, 27-50n-10w, prep to run cas, td 1477 ft.

PUEBLO—Rozella Oil Co.'s Shaw 1, nw 3-22s-63w, sd 1190 ft. Christopher Oil Synd.'s Stanbeck 1, nw 19-22s-63w, dr 400 ft. Christy-McCormick-Frantz Synd.'s Mannerich 1, sw 34-21s-63w, repairs, td 175 ft. Windle et al's Alber 1, se 6-22s-63w, prep to spud. Sheffer et al, 1, se 4-22s-63w, ready to spud.

RIO BLANCO—White Eagle O. & R. Co.'s Forhsm 1, sw 9-2s-86w, sidetr lost bit, td 519 ft.

YUMA—Major Pete., Inc., sw 7-2s-43, skdg rig.

WELD—Platte Valley Pete Corp.'s Patterson 1, sw 24-6n-61w, sd 4180 ft.

NEW MEXICO

CHAVES—Snowden & McSweeney's Merchant 1, ne 27-15s-23e, dr 3917 ft. R. T. Beal et al's Russell 1, 21-14-25e, dr 1525 ft. Warman et al., 1, sw 23-13s-24e, sd. Tannehill et al's Butler 1, se 15-12s-24e, dr 812 ft. Transcontinental's Robert 1, 1-14s-28e, dr 667 ft.

DE BACA—Matador Oil Co.'s State 1, sw 6-4n-20e, ready to deepen, td 630 ft. Pittsburgh Oil Co., 1, ne 16-1s-27e, dr 4195 ft, hole caving. Transcontinental's McWhorter 1, 6-35-22e, set 6 5/8-inch.

GUADALUPE—Hanchett Oil Co., 2, 14-8n-24e, fsg bit 2400 ft.

LEA—Midwest's Capps 31, sw 3-19s-39e, rigged. Midwest's Farnsworth 19, 12-26-37e, dr by bit, 3892 ft. Midwest's Farnsworth 13C, 13-26-36e, dr 2855 ft. Marland's Reed 1, 22-20s-36e, dr 4255 ft; Myers 1, 26-20s-37e, to plug back and cem off water 3915 ft; Warrn, 1, 29-20s-36e, dr 4125 ft; Lockhart 1, 31-21s-36e, swbg 200 bbls at 3990 ft. Gypsy Oil Co.'s Mattern 1, 24-21s-36e, dr 715 ft. Exploration Co.'s Record 1, 26-19s-35e, td 4556 ft. Morton et al's State 1, ne 32-11s-38e, dr 1661 ft. Texas' Lynch 1, se 34-20-34, dr 2215 ft; Sheppard 1, ne 6-26s-37e, spray oil 3230 ft, tools lost; Moberly 1, se 17-26s-37e, fsg 3540 ft. Curtis Dr. Co.'s Nixon 1, 22-18s-34e, sd 1200 ft. Cranfill & Reynolds' Wilson 1 ne 23-25s-36e, dr 1275 ft. Skelly Oil Co.'s Joiner 1, se 26-25s-36e, wtg for pipeline connections. Empire Gas & Fuel Co.'s State 1A, nw 12-21s-34e, dr 4271 ft. Texas Pacific Coal & Oil Co.'s State 1, sw 22-23s-35e, dr 3300 ft. Henderson et al's McDonald 1, se 18-20s-34e, fsg 1515 ft. Vacuum Oil Co.'s 1, 14-17-34, dr 1227 ft. Bordages et al's Hughes 1, 27-19s-38e, co 4012 ft, 300 ft oil in hole. Pueblo Oil Co.'s Scott 1, se 29-25s-37e, dr 606 ft.

McKINLEY—J. W. Halsell's Santa Fe 1, 17-18n-9w, td 1032 ft.

ROOSEVELT—J. T. Keegan et al's Pepper 1, 6-1s-36e, ready to spud. Smith & Sloan, Lovern 1, se 4-3s-35, spd to 61 ft.

RIO ARRIBA—Berringer et al's Hartman 1, ne 8-29n-7w, co 520 ft.

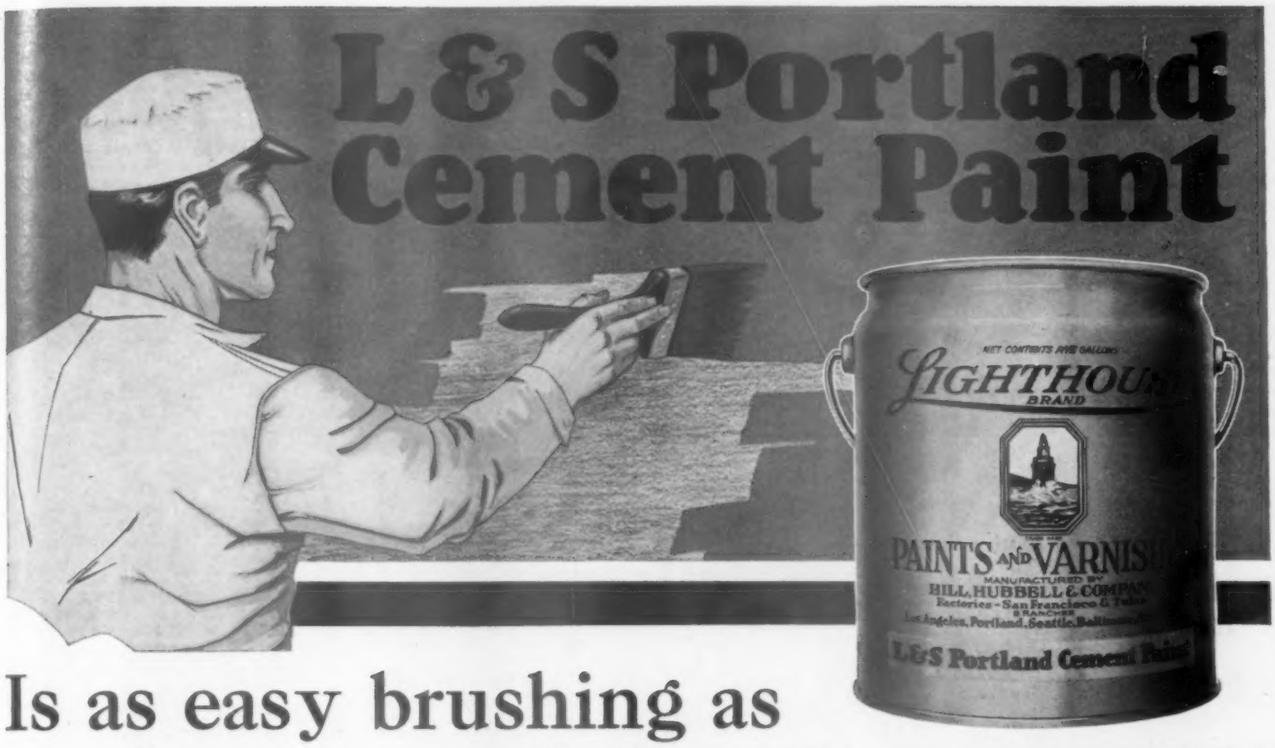
SAN JUAN—Continental Oil Co.'s Munoz 17, 2-29-19, dr 6531 ft. Dorothy Oil Co., 29-30-9, sd 712 ft. Huerfano Oil Co.'s Wiltbank 1, 25-29-11, td 800 ft. San Juan Pete. Co., 1, 9-29-13, sd 2950 ft. Kirtland Dr. Co.'s Hunt 1, 10-29-15, td 450 ft. Kutz Canon O. & G. Co.'s Day 1 ,29-28-11, stand 722 ft. Blackrock Oil Co.., 1, sw 11-25s-13w, co 1900 ft. Iowa Oil Synd.'s Viles 2, 28-29-11, co after shot 694 ft. Angel Peaks Oil Co.'s Kutz Canon 1, 11-28n-11w, co 1900 ft. Great Mesa Oil Corp's Roderick 1, sw 11-22n-14w, sd 215 ft. Milwaukee-N. M. Synd.'s Beardsley 1, 30-28n-11w, prep to resume, 1100 ft. Childers D. & P. Co.'s Westwater 2, nw 24-31-16w, dr 2105 ft.

SAN MIGUEL—E. Adams et al's Deason 1, 14-15n-16e, sd 1235 ft. Benedict-Wilson 1, ne 25-17n-16e, sd 800 ft.

SOCORRO—Arnold et al., 2, ne 13-6s-1w, run 6 5/8-inch at 1400 ft.

TORRANCE—Bluhall O. & G. Co., 20-6n-10e, sd 1735 ft. Hall et al's Pinos Wells 1, sw 25-3n-13e, stand 400 ft. Sinnock et al's Kutchin 1, ne 13-7n-7e, spd to 100 ft and sd.

VALENCIA—Rio Puerco Oil Co.'s N. M.-Ariz. Land Co. 2, nw 13-6n-2w, wait pipe 3145 ft. Acme Oil Co.'s N. M.-Ariz. Land Co. 1, 26-6n-3w, ur 6 5/2-inch, td 3650 ft.



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SOUTH LOUISIANA

Company, Well and Location	Initial Production Bbls.	Depth
IBERIA PARISH—		
Jefferson Lake Oil Co., Lake Peigneur 1, Jefferson Island	*	1140

ACADIA PARISH—E. F. Simms' Clement 1, Jennings, 3872 ft deep; Clement 2, Jennings, sd 3840 ft; Grace von Schuler 1, Jennings, abn 4550 ft; Jennings Oil Co. 1, Jennings, sd 3545 ft; Cockrell 1, Jennings, sd 4330 ft; Cockrell 2, Jennings, sd 3835 ft.

ASCENSION PARISH — Gulf's United Lands Co. 11, Sorrento Dome, dr below 3000 ft; Belle Helene Sugar Co. 1, Darrow, set 10-inch cas at 1100 ft. Triumph Oil Corp.'s J. D. Lacey et al 2, 3 mi se Sorrento, depth 2100 ft. Burnside Oil Co.'s Roberts 1, sd 920 ft; Robert 2, ru. Big Dome Drlg. & Dev. Co. and J. S. Kimbrough's Rearwood 1, Sec. 82, sd 1000 ft. Baton Rouge Pet. Co.'s Liotta 1, sd 1000 ft.

CALCASIEU PARISH — Union Sulphur Co.'s Fee 736, Sulphur, prep to deepen after testing salt water at 4935 ft; Fee 739, Sulphur, abn at 3000 ft; Fee 740, Sulphur, dr shale at 6170 ft; Fee 741, Sulphur, dr gbo at 3030 ft; Fee 742, set surface cas. J. W. Watson et al's La. Land Co. 1, Sulphur, sd 5350 ft.

CAMERON PARISH—Pure Oil Co.'s Yount-Lee 7, Sweet Lake, sdtr 4585 ft; Yount-Lee 8, Sweet Lake, dr 4610 ft gbo. Calcasieu Oil Co.'s Doiron 5, E. Hackberry, dr 2800 ft; Valery 6, East Hackberry, dk. The Texas Co.'s Calcasieu Lake B-4, E. Hackberry, dr 1340 ft gbo; Calcasieu Lake A-3, S. Calcasieu Lake, driving piling. Rycade Oil Corp. and Humble's Gulf Land 1, Hackberry, dr 3551 ft hard lime; Gulf Land 2, Hackberry, ru. Yount-Lee Oil Co.'s Kaough 1, Hackberry, dr 2360 ft gbo; Vincent 2, dr 2530 ft shale. Federal Pet. Co.'s Kaough 1, Hackberry, completed for 800 bbls at 3215 ft; Kaough 2, Hackberry, completed for 1600 bbls at 3280 ft; Kaough 3, Hackberry, heaving shale at 3550 ft, standing; Kaough 4, Hackberry, set 10-inch cas at 1175 ft; Duhon 1, Hackberry, dr 2960 ft gbo. Federal Pet. Co.'s Duhon 2, Hackberry, dk. Cameron Oil Co.-Rycade's Duhon 3, Hackberry, preparing to pump; Kaough 1, Hackberry, ru. Moon Oil Co.'s Sanner 2, Hackberry, completed for 900 bbls at 3130 ft; Sanner 3, Hackberry, lcn. Sun Oil Co.'s Vincent 1, Hackberry, dr 3125 ft shale; Vincent 2, Hackberry, dr 2300 ft sand and boulders. Cherokee Oil Co.'s Duhon 1, Hackberry, dr 3160 ft sand. Rex Pet. Co.'s Noble 1, Hackberry, dr 2235 ft hard sand. Pure Oil Co.'s Duhon 1, Hackberry, ru; Duhon 2, Hackberry, bldg dk. Chas. T. Madison's Duhon 1, Hackberry, set surface casing. Shell's Watkins 6, Black Bayou, dr 3575 ft shale and lime; Watkins 8, Black Bayou, dr 1100 ft anhydrite.

IBERIA PARISH—The Texas Co.-La. Land & Explo. Co.'s Vermilion Bay A-3, Vermilion Bay, dr 4300 ft rock. Gulf's Fannie Kling et al 3, Loreauville, dr 3820 ft sand; Moresi Co. et al 1, Loreauville, dr 2760 ft lime. Jefferson Lake Oil Co.'s Lake Peigneur 1, Jefferson Island, abn at 1140 ft.

IBERVILLE PARISH—Shell's Wilbert 3, White Castle dome, washing down at 3802 ft. Standard of La.'s Wilbert 2, Bayou Blue dome, Sec. 74, ru; Wilbert 3, Bayou Blue dome, canal completed to lcn; Schwing 1, Bayou Blue dome, set cas to test, depth 3650 ft; Schwing 2, Bayou Blue dome, Sec. 74 9s-10e, bldg dk. Union Sulphur Co.'s Schwing 3, Bayou des Glaise dome, sd 3675 ft.

JEFFERSON DAVIS PARISH — Vacuum Oil Co.'s Earl 1, Roanoke, 3800 ft gbo; De-Vilbiss 1, Roanoke district, dr 5000 ft in sdtr hole.

LA FOURCHE PARISH — Gulf's Stark 9, Thibodaux, dr around 2000 ft. Union Sulphur Co.'s Dibert-Stark-Brown 1, Thibodaux, 1175 ft caprock; Dibert-Stark-Brown 2, Thibodaux, salt at 1775 ft.

PLAQUEMINE PARISH—Gulf's Morris & Rose 1, Spanish Pass, 5 mi sw Venice, sd. The Texas Co.'s Garden Island Bay 1, 15 mi se Venice, dk.

POINT COUPEE PARISH—Miller et al's Kornbacker 1, sd 1925 ft. Fruen et al's La Cour 1, ru and standing.

ST. JAMES PARISH—U. S. Mineral Dev. Co.'s Reynaul Co. 1, sd 1720 ft.

ST. LANDRY PARISH—The Texas Co.'s Botany Bay Fee 1, Port Barre dome, tested salt water, will deepen from 3765 ft.

ST. MARTIN PARISH—Rycade's State 3, Bayou Bouillon, set cas 1100 ft; Bayou Bouillon Fee 6, set cas at 3122 ft; Bayou Bouillon Fee 7, ru; Bayou Bouillon Fee 8, dr 3610 ft water sand; Atchafalaya Fee 3, Bayou Bouillon, abn in salt at 5165 ft; Atchafalaya Fee 5, Bayou Bouillon, dk. Ohio Oil Co.'s Martin et al 3, Hager dome, set cas at 4450 ft; Burke 3, Hager dome, lcn. The Texas Co.'s St. Martin Land Co. Fee 1, Hager dome, ru. Yount-Lee Oil Co.'s La. Pet. Co. 4, Anse la Butte, abn at 3750 ft.

ST. MARY PARISH—J. Dannenbaum et al's Le Blue 1, Charenton, sd 3100 ft.

ST. TAMMANY PARISH—Pearl Oil Corp.'s Fritsche 1, Slidell, td 2020 ft.

TANGIPAHOA PARISH—Tanli Oil Co.'s Weinberger 2, sd 4050 ft. Jean Dev. Co.'s Lake Superior Piling Co. 1, sd 220 ft.

TERREBONNE PARISH — Southern Gas Co.'s Peoples Sugar Co. 1, Houma, sd 2287 ft. The Texas Co.'s Lake Barre 1, Sec. 37-21s-19e, bldg dk. Lake Pelto B-1, Sec. 8-23s-18e, moving in; Four Isle Bayou B-1, canal ready; Timbalier Bay A-1, piling down for dk. Bay Coon Road B-1, Sec. 17-22s-18e, canal to lcn ready; Dog Lake Bayou A-1, Sec. 6-22s-16e, capped piling.

Kern County Wildcats

Bakersfield, Calif.—Little change has been noted during the week in the status of important Kern County wildcats. Several new wells have been started, but a corresponding number of drilling wells have been suspended. General Petroleum Corporation has located a test on Section 25-26-25, near McFarland, while the Rosedale Oil Company is ready to spud in on Section 33-29-26. Tests which some time ago were promising wildcats, but which are not shut down, are W. W. Stabler's Tejon 1, near Comanche Point, Midway Northern Oil Company's Brown 1, an Edison test, and the Doheny-Stone Drilling Corporation's Salisbury 1, near Buttonwillow.

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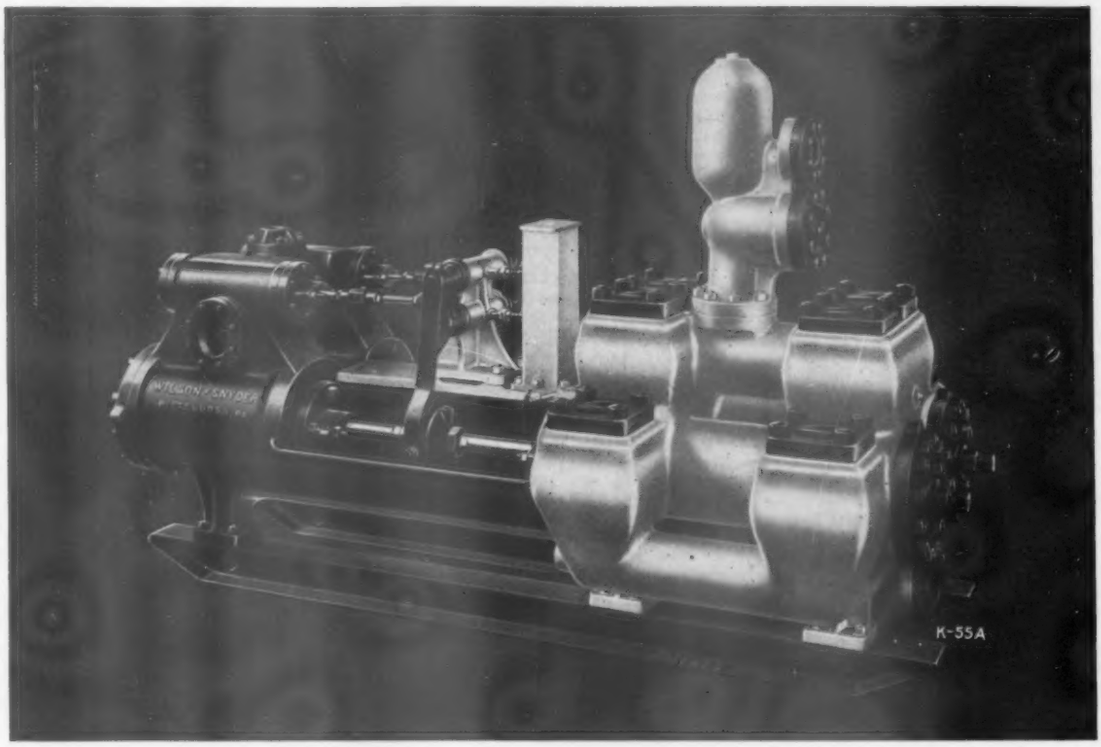

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CROCKETT COUNTY—
Barbara Oil Co., Cox 1 ..... * 1507

IRION COUNTY—
Sun Oil Co., Tankersley 1 ..... * 1452

PECOS COUNTY—
Talbot & Dittman, Unsicker 1 ..... * 1508

ANDREWS COUNTY—Deep Rock Oil Co.'s Hostetter 1, elev 3224 ft, top salt 1890 ft, dr 3170 ft. Mid-Continent Pet. Corp.'s Fisher 1, rig.

BORDEN COUNTY—Gibson-Johnson et al's Higginbotham 1, rig. Greene O&R Co.'s Slaughter 1, co 565 ft. C. E. Hyde et al's Beal 1, sd 405 ft. Teas & Wheeler's Long 1, lcn.

BREWSTER COUNTY—Ed. W. Bateman & Co.'s Nevill 1, elev 3950 ft, set cas to test good show gas, td 1926 ft. Brewster Oil Co.'s Fee 1, dr 855 ft. Johnson & Bert Weekly's Jackson-Harmon 1, spudded and sd.

COKE COUNTY—Cates & Dennis' J. R. Mims 1, sd 1585 ft; Mims 2, spudded and sd. Mid-Kansas O&G Co.'s Lackey 1, elev 2102 ft, ur 3212 ft.

CONCHO COUNTY—J. L. Duffey et al's Lovelace-Lockhart 1, dr 880 ft. Lloyd Jones et al's Jones 1, sd 660 ft.

CRANE COUNTY—Gulf Prod. Co.'s Waddell 6, elev 2733 ft, top salt 1270 ft, top lime 3147 ft, sd for shot with 800 ft 35.8 deg. oil in hole 3307-3480 ft.

CROCKETT COUNTY—W. W. Donnelly-W. A. Moncrief et al's Massey-Todd 1-A, machine; Todd 1, (Sec. 35) dr 510 ft; Todd 2, dr 1400 ft. W. W. Donnelly et al's Shannon 1, (Sec. 24) spudded and sd. Eppenauer Drlg. Co. & West Texas Pet. Corp.'s Noelke 1, spudded and sd. Lewis & Daniels' Pecos River Bed 1, elev 1967 ft, dr 605 ft. Tidal Oil Co.'s W. W. Weatherred 1, elev 2329 ft, top salt 485 ft, dr 1540 ft. J. D. Wheeler et al's State 1, elev 2326 ft, top salt 492 ft, ur 600 ft.

CULBERSON COUNTY — Deep Rock & Grisham-Hunter's Kloh 1, set cas 300 ft. Hickey et al's Finley 1, elev 3916 ft, sd 1780 ft.

JEFF DAVIS COUNTY—Sam F. Means et al's J. Z. Means 1, ur cas 4005 ft.

FISHER COUNTY—Bickerstaff et al's McWhirter 1, elev 1932 ft, sd 2000 ft. Cranfill-Reynolds & Sun Oil Co.'s Brown 1, comp swab 58 bbls oil 3193-97 ft; Fleming 1, elev 1803 ft, top lime 3135 ft, dr 3195 ft; B. F. Willingham 2, elev 1808 ft, dr 2615 ft. Culberson Bros. & Mesa Oil Co.'s Griffin 1, dr 1070 ft. J. B. Dunigan et al's Henry 1, elev 1913 ft, dr 2450 ft. Gilman-McMurray & French's Cleveland 1, elev 1973 ft, dr 1940 ft. Landreth Prod. Corp.'s Cooper 1, elev 1825 ft, top lime 2760 ft, dr 2885 ft. Bob Rainey et al's Marberry 2, elev 1929 ft, top lime 2995 ft, sd 3507 ft. Roeser-Pendleton & Amerada's Haught 1, dr 755 ft. The Texas Co. & Phillips Pet. Co.'ss W. H. Hall 1, elev 2102 ft, dr 1190 ft. White Eagle O&R Co.'s Hughes 1, spudding.

GAINES COUNTY — Pure Oil Co.'s Williamson 1, elev 3197 ft, top salt 2333 ft, dr 3992 ft.

GARZA COUNTY—Emerald Oil Co.'s J. M. Boren 4, elev 2343 ft, top lime 1975 ft, pumped 60 bbls oil first 24 hours and sanded up after shot in pay 2507-35 ft, td 2573 ft.

GLASSCOCK COUNTY — Kyle & Daniels' Meek 1, elev 2792 ft, sd 405 ft. Gibson-Johnson et al's Mann 1, elev 2703 ft, top salt 1170 ft, top lime 2640 ft, dr hfw 3415 ft. McElreath et al's Underwood 1, lcn abn. Meriwether Oil Co.'s McDowell 2, elev 2517 ft, top salt 970 ft, top lime 2445 ft, sd 2960 ft. Penn Oil Co. & Empire's Hughes 1, elev 2733 ft, top lime 2335 ft, ur 2775 ft. White Eagle O&R Co.'s Dunbar 1, elev 2705 ft, top salt 1140 ft, top lime 2685 ft, dr hfw 3590 ft. World Oil Co.'s McDowell 1-C, elev 2530 ft, dr 1030 ft.

TOM GREEN COUNTY—F. P. Green et al's Fee 1, sd 1931 ft. Williams et al's Wilkey 1, co 370 ft.

HOWARD COUNTY — Gibson-Johnson et al's H. N. Reed 1, lcn.

HUDSPETH COUNTY — The California Co.'s University 1, elev 5833 ft, dr 641 ft. Lockhart Bros. et al's Western State 1, spudded and sd. Western States Oil Co.'s Gardner-Mosely 1, elev 5086 ft, sd 3155 ft; Moore 1, elev 5150 ft, sd 2760 ft.

IRION COUNTY — Furhman Pet. Corp.'s Sugg 1, Lse. 2, machine; Sugg 1, Lse. 3, (Sec. 3009), elev 2415 ft, top salt 811 ft, top lime 1622 ft, dr hfw 2200 ft. Kimbrough et al's Nutt 1, elev 2299 ft, sd 1420 ft. Kimbrough & Flinchbaugh's Tankersley 1, elev 2241 ft, sd 350 ft. Kingwood Oil Co.'s Sugg 1, elev 2334 ft, sd change power, td 5875 ft. Pecos Valley Oil Co.'s Joe Stock 1, elev 2110 ft, dr 1010 ft. Signal Oil Co.'s Sugg 2, elev 2498 ft, top salt 760 ft, top lime 1470 ft, dr 2070 ft. Webb et al's Nutt 1, elev 2351 ft, sd 3240 ft.

JONES COUNTY—Culberson Bros. et al's Anderson 1, lcn. E. P. Campbell & Co.'s Herndon 2, sd 2435 ft. Grisham-Hunter Corp.'s Hester 1, dr 410 ft. P. K. French et al's Leeson 1, spudded and sd. McClanahan et al's Hall 1, dr 1750 ft. McGinley-Sigler Co.'s Whittemore 1, sd 1600 ft. McNeeley et al's Bland 1, spudded and sd. Mid-Sun Oil Corp.'s Hoehn 1, elev 1899 ft, dr 2485 ft. Milt Richardson-McGinley et al's Martin 1, dr by junk 1300 ft. Roeser-Pendleton et al's Castle 1, elev 1865 ft, dr 2405 ft. Sedgwick O&G Co.'s Brown 1, lcn; Routh 1, sd 1900 ft. Tomberlin et al's Horn 1, spudded and sd. White Eagle O&R Co.'s Teague 1, lcn.

KING COUNTY—Huff Oil Co.'s Martin 1, rig.

LOVING COUNTY—Lockhart & Co.'s Hazell 1, elev 2705 ft, rig; W. D. Johnson 1, dk; H. L. Lepp 1, top salt 725 ft, dr 2825 ft; Hubbard Heirs 1, elev 2706 ft, top salt 700 ft, fsh col cas after shot and flow 50 bbls 31 deg. oil daily 2592-2621 ft; Hubbard 2, rig; J. J. Wheat 1-H, rig.

LYNN COUNTY—Hart Oil Corp. & McCamey's Edwards 1, elev 3128 ft, fsh 915 ft. H. F. Miller et al's May 1, spudded and sd.

MENARD COUNTY—Carl G. Cromwell et al's Wilhelm 1, elev 2245 ft, trace oil 2900-05 ft, dr 3015 ft. J. B. Holstein et al's Davis 1, lcn.

MIDLAND COUNTY—Shoup et al's Parks 1, sd 4980 ft. Phillips Pet. Co.'s J. V. Stokes 1, dk.

MITCHELL COUNTY — The California Co.'s J. W. Clark 2, dk. Clopton & Hammon's McKenzie 1, dk. Republic Prod. Co.'s Scott 1, lcn. McGinley-Sigler Co.'s Scott 1, lcn. Simms Oil Co.'s Ellwood 1, elev 2237 ft, cased off gas, dr 1010 ft; Ellwood 2, machine; Ellwood 1-A, lcn. Teas & Wheeler's Radford 1, elev 2223 ft, top salt 667 ft, top lime 1365 ft, dr 3495 ft. Westyde Investment Co.'s Ellwood 1, dk.

NOLAN COUNTY—L. G. Bradstreet et al's Kuteman 1, rig. C. M. Root Drlg. Co.'s Lon Martin 1, rig; Simpson 1, elev 2033 ft, sd 3090 ft. White Eagle O&R Co.'s Allyn 1, dry and abn 3040 ft.

PECOS COUNTY—Alexander-Lyles et al's Sellman 1, sd 1655 ft. Atlantic Oil Prod. Co.'s J. C. Trees 1, lcn. Benedum-Trees et al's Corder 1-A, elev 2713 ft, top lime 1840 ft, dr 3485 ft. M. H. Black et al's Pecos 1, lcn. Buell-Hagan et al's University 1-B, lcn. A. R. Bell et al's Gray 1, lcn. Karl A. Crowley et al's R. G. Heiner 1, dr 510 ft. Doran & McGee's Pecos 1, lcn. Cowboy Evans et al's Pecos 1, lcn. Spot Geyer & Earl Frates' B. F. Smith 1, rig. J. W. Grant et al's Turney 1, elev 2592 ft, top lime 1015 ft, sd 4590 ft. Grayburg Oil Co.'s University 1, elev 2725 ft, top salt 990 ft, dr 1105 ft. Imperial O&G Co.'s Pecos 1, lcn. Marland Prod. Co.'s Blakeslee 1, elev 2448 ft, top salt 1380 ft, dr 1710 ft. McCarty Oil Co.'s A. A. Gray 1, elev 2524 ft, co after re-setting casing, oil sand 1150-62 ft; Gray 2, lcn. Mauch & Krogen's Holmes 1, elev 2325 ft, top salt 535 ft, sd 1010 ft. R. A. Moore et al's R. W. Arnold 1, lcn. W. A. Moncrief et al's Tippett-Unit plan 1, lcn. J. D. O'Mara et al's L. L. Byrne 1, spudded and sd. Pecos Valley Oil Co.'s Fee 2, elev 2499 ft, top salt 1107 ft, comp flow 80 bbls oil daily 1617-32 ft. Perren et al's Eaton 1, dr 330 ft. Phillips Pet. Co.'s W. Courtney 1, dk. Schumaker et al's Williams 1, elev 2388 ft, sd 700 ft. Shell Pet. Corp.'s & Kirby Pet. Co.'s University 1, elev 2628 ft, dr 4100 ft. Southern Crude Oil Pur. Co.'s Scarbauer 1, elev 3680 ft, dr 3955 ft. Stein & McGee's Peterson 1, machine. Tidal Oil Co. et al's University 1, lcn. Transcontinental's White-Baker 1, bldg road; University 1, elev 2552 ft, top lime 1035 and 3315 ft, dr lime 4247 ft. Trees Oil Co. & Empire's J. C. Trees 1, dr 430 ft. Bert Weekly et al's Byrne 1, spudding.

PRESIDIO COUNTY — Brite Prod. Co.'s L. C. Brite 2, dr 205 ft. C. E. Miller-Delmar-Phillips Pet. Co.'s Tootle 1, pull casing 2340 ft.

REAGAN COUNTY — The California Co.'s University 5, elev 2879 ft, top salt 1280 ft, top lime 2943 ft, dr 2957 ft. Kemrow & Co.'s Sawyer 1, lcn. Skelly Oil Co. et al's University 3, lcn. Oberholtzer et al's Talley 1, dr 495 ft.

REEVES COUNTY—E. W. Brooks et al's Eddins 1, elev 2719 ft, top salt 1622 ft, top lime 3216 ft, sd 5658 ft. Exploration Co.'s Kinney 1, elev 2847 ft, pull cas 2900 ft. Penn Oil Co.'s Bowles 1, elev 2783 ft, salt 1725 to 4425 ft, dr 4500 ft. Southern & Dixie Oil Co.'s Kloh 1, dr 680 ft. Lee O. White et al's Kloh 1, elev 3244 ft, spudded and sd.

RUNNELS COUNTY—G. W. Boyce et al's Lange 1, sd 1350 ft. Huff Oil Co.'s Furgason 1, lcn. Independent O&G Co.'s Rollwitz 1, dr 710 ft. Marland Prod. Co.'s Herring 1, dr 1875 ft. Herbert Oil Co.'s Currie 1, sd 360 ft. Ira Nourse & Elvin Tilton's Cramer 1, elev 1775 ft, sd 3000 ft. Union Oil Co.'s Allen 1, dr 3450 ft. Vacuum Oil Co.'s McMillan 4, lcn.

SCHLEICHER COUNTY — Ft. McKavitt Oil Co.'s Tisdale 1, elev 2155 ft, sd 1535 ft. Interstate Explo. Co.'s Whitten 1, ur 935 ft.

SCURRY COUNTY—Joe Maxwell & Lou Ladd's Koonsman 1, lcn. R. B. Pender-Dieckman et al's Davis 1, elev 2208 ft, top salt 445 ft, dr 2525 ft.

STERLING COUNTY — Foster-Gracey Oil Co.'s Foster 1, elev 2260 ft, fsh 2175 ft. Miller Bros. et al's Foster 1, elev 2667ft, top salt 1140 ft, dr 1305 ft.

SUTTON COUNTY — Phillips Pet. Co.'s Holman 1, elev 2247 ft, top lime 2315 ft, dr black shale 6065 ft. L. G. Priest et al's Allison 1, set 15½ cas 530 ft. Southern & Dixie Oil Co.'s Allison 1, ur 3507 ft.

TAYLOR COUNTY — Grisham - Hunter Corp.'s Campbell 1, dr 2670 ft. J. B. Jameson et al's Webb 1, dr 450 ft. Mid-Continent Pet. Corp.'s Taylor 1, elev 1933 ft, dr 2645 ft. Thompson et al's Hammer 1, sd 1615 ft. L. H. Wentz et al's Armour 1, ur 1825 ft.

TERRELL COUNTY—Milham Corp.'s Bassett 1, elev 2270 ft, sd 4635 ft. Keck-Pecos Oil Trust's Hamilton 1, elev 1733 ft, sd 1749 ft.

VAL VERDE COUNTY — Dyer Bros. et al's Wilson 1, elev 2115 ft, sd 2705 ft. Producers Oil Co. et al's Everett 1, sd 2115 ft. Val Vert Oil Corp.'s Bassett 1-A, elev 2069 ft, fsh 3760 ft.

WARD COUNTY — Barstow O& G Co.'s Monroe-Gillespie 1, spudded and sd. Gulf Prod. Co.'s G. W. O'Brien 4, ur cas 1252 ft. J-H-L Oil Co.'s Hayzlett 1, elev 2522 ft, top salt 792 ft, swab 112 bbls oil 24 hrs. 2455-69 ft; Hayzlett 2, spudded and sd. K. Kimberlin et al's Thompson 1, lcn. Tex-Oil Prod. Co. (Lovelace et al's) Redman 1, dr 935 ft.

WINKLER COUNTY—M. J. Bashara et al's Fee 1, dk. Gulf Prod. Co.'s Scarborough 1, elev 2953 ft, top salt 1210 ft, flow 48 bbls 36 deg. oil daily dr lime 2987-3247 ft. Liner Drlg. Co.'s Campbell 1, rigging up. Prairie O&G Co.'s Scarborough 1, elev 2914 ft, cem 8-inch cas and stdz 2839 ft. Shell Pet. Corp. & Llano Oil Co.'s Scarborough 4, elev 2953 ft, top salt 1105 ft, comp S&F 105 bbls oil daily 2990-3315 ft; Scarborough 5, elev 2966 ft, top salt 1110 ft, dr 2812 ft. Texas-Canadian Oil Co. & Superior's Kloh 1, dr by junk 900 ft.

YOAKUM COUNTY—Bert Weekly et al's Knight 1, sd 995 ft.

Mt. Poso Wildcats

Bakersfield, Calif.—Leasing in the Mt. Poso district continues active, with a wide area extending from the old Kern River field to Delano coming in for the most attention. Recent discoveries near the Round Mountain and Mt. Poso fields have attracted wide attention and leave the way open for additional wildcatting along the major fault running across the district.

Bakersfield, Calif.—Shell Oil Company has made two locations in the Round Mountain field, Jewett 6 on Section 29-28-29, and Freeman 4 on Section 20-28-29. Honolulu Consolidated Oil Company, until recently the principal operator in the field, does not have an active drilling well.

Louisiana--Arkansas Field Notes

Well Completed Between Stephens and Louann Fields

SHREVEPORT.—A commercial oil well has been completed as a connecting link between the producing area of Stephens, Columbia County, Arkansas, and the Louann sector of the old Smackover field in Ouachita County. Charles McDonald's Wilson 1 in 25-15-18, Ouachita County, about five miles west of Louann and 10 miles east of Stephens, flowed 305 barrels in 24 hours, on the first official gauge, but on Saturday had dropped to 94 barrels.

Oil from the McDonald well tested 30.7 degrees gravity, corrected b. s., four per cent; wax, 1.2 per cent; gasoline 26 per cent., gravity 58.9; kerosene, 10 per cent.; gravity 39.2; gas oil, 20 per cent.; gravity 34.2; fuel oil coal test at 47 gravity, 15 per cent.

Considerable acreage has changed hands in the vicinity of the well. Among the purchases are several forties by The Texas Company, which paid $25 an acre in Section 14-15-18.

McDonald Brothers are deepening Wilson 1, in the same section as Charles McDonald's producer, with cable tools at 2836 feet. This well, which stood at one time with 2650 feet of oil in the hole, refused to flow after being swabbed. It is a quarter of a mile south of the other tests.

New Part of Champagnolle Opened

Ohio Oil Company's W. J. Raulston 1 in Section 12-17-14, completed in a portion of the Champagnolle field heretofore condemned, and being a quarter of a mile southwest of nearest production in Section 7-17-13, the south part of the northeast extension of the field, what appears to be a good well. The Raulston test gauged 2069 barrels through a 7/16-inch choke. However, approximately 20 per cent. of the yield is salt water. The 2069 barrels gauged through the choke was in excess of the water. Total depth of 3037 feet.

Only two producers were added in the Shreveport district of North Louisiana, South Arkansas, and East Texas, during the week, aside from the Raulston and Wilson wells. In the Ouachita County part of Smackover, Shell Petroleum Corporation perforated casing from 1953 to 1973 feet in Snyder 4 in Section 34-15-15 to complete the well as a 40-barrel pumper, three per cent. salt water. In the southern edge of Champagnolle, Magnolia Petroleum Company added W. K. Gregory 2 in Section 15-17-14, at 2828 feet in four feet of sand as a 35 barrel pumper, three per cent. of the yield being salt water.

Four Gas Wells Completed

North Louisiana added three gas wells during the week and the Panola County gas field of East Texas added one gasser. Magnolia Petroleum Company completed a shallow two million foot gas well in Fortson 3 in Section 4-12-11, DeSoto Parish, Naborton field, at total depth of 748 feet. The Monroe gas field added two gas wells; Natural Gas Production Company's Crossett Lumber Company 23 in Section 26-21-4e, Morehouse Parish, which gauged 10,143,000 feet, at 2190 feet; and Southern Carbon Company's Fairbanks 11 in Section 23-20-4e, Ouachita Parish, which gauged 7,800,000 cubic feet at 2140 feet.

East Texas gas well was the Texas Company's Adams B-10 completed at 2672 feet for six million feet of gas.

The only failure recorded during the week was a deep test in Pine Island, Caddo Parish, which tested dry at 4037 feet. This was Dixie Oil Company's Huckaby 4 in Section 11-21-15.

The wildcat creating most interest in the Shreveport district during the week, aside from the Wilson tests, is Gulf Refining Company's Caraway 1 in the Patterson survey of Shelby County, East Texas, which is now coring at 3250 feet in hard blue shale with streaks of lime after showing 53,000 cubic feet of gas from 3101 to 3115 feet, after an Edwards Flow Tester was installed.

This test is 2½ miles northeast of the company's Pickering Lumber Company 1, which was completed several months ago below 3400 feet flowing 140 barrels of oil daily and making about four million cubic feet of gas.

Fourteen Locations Made

Fourteen locations were announced during the last week as compared to 14 the week before. Six of the locations were for Arkansas, six for North Louisiana, and two for East Texas.

J. W. Olvey has made location for Cottrell 1 in SW of NW of Section 22-17-17, Union County, Arkansas, a wildcat test. Another wildcat in another part of the same county is planned by W. M. Coats, trustee, who has made location for McDuffie 1 in SW of NW of Section 32-19-16. Two new locations were made for Champagnolle. Arkansas Natural Gas Corporation has derrick pattern for Morris 1, in NW of SW of Section 7-17-13, in the northeast extension of the field, while Lion Oil and Refining Company has derrick up for Stowe 1 in NW of SW of Section 4-17-13, two miles east of production in the northeast extension. In Logan county, a wildcat area, Arkansas Natural Gas Corporation is rigging up for Hanna 1 Section 26-7-23. Helena Oil and Gas Company is drilling at 1405 feet in Tickler 1, in Section 19-19-22, Columbia County, an old test taken over from the Van Hazen Syndicate.

In the Elm Grove gas area of Bossier Parish, Louisiana, Corbitt and associates are rigging up for Murff 1 in Section 18-17-11. Magnolia Petroleum Company is rigging up for Fortson 4, in Section 4-12-11, DeSoto Parish, Naborton district.

The Monroe gas area obtained four new locations during the week. In Morehouse Parish, Industrial Gas Company will drill Crowder Moore 1 in Section 31-21-5e, and Natural Gas and Production Company has locations for Crossett Lumber Company 24 in Section 25-21-4e, and for Nolan 1 in Section 11-20-3e. In Union Parish, Imperial Oil and Gas Company has made location for Striplin 1 in Section 31-21-5e.

Both of East Texas' new locations are in the Bethany gas area of Panola County. Adams and Walker are drilling at 780 feet in Adams 1 in the Ezekiel Jones survey, and The Texas Company has location for T. C. Adams A-9 in the Thomas Cox headright.

Claiborne Parish Test Coring

Claiborne Parish, has only one active wildcat operation under way where three were under way a fortnight ago. Dixie Oil Company abandoned Gilbert 1 in Section 27-21-5w, at 5034 feet, and Smitherman and McDonald are shut down waiting orders at 4780 in Miller 1, a deep test in Section 17-23-8 in the old Haynesville field. El Dorado Chief Oil

Company's Baker 1 in Section 26-20-7 is the only active wildcat in Claiborne. It is coring sand at 2940 feet.

Hopes have been revived of getting an oil producer on the eastern edge of the old Shongaloo field in Webster Parish, where it nearest approaches the western edge of Haynesville production, with a showing in J. W. Clark's Mayfield 2 in Section 20-23-9, where 600 feet of oil is standing in the hole at 2767 feet, with four feet of sand. Arrangements are being made to pump the well.

Hopes entertained that a wildcat east of Stephens production and over the line in Union County, Arkansas, would provide another link between the McDonald test were temporarily dashed when Louisiana Oil Refining Corporation tested 17 thribbles of salt water in Manley 1 in Section 15-15-19 at 2399 feet, after an oil sand had been cored several feet. The test will be deepened. E. A. Martin is drilling at 3265 feet in Dale 4, a wildcat in Section 23-15-26, Miller County.

Joe Hurley's Arkansas Land and Timber 1 in Section 29-16-12, Calhoun County, has reached its contract depth at 3302 feet and as the test is under water, whether it will be drilled further is problematical. Frazier and associates have abandoned location for Laney 1, a wildcat in Section 30-19-16, Union County. The Texas Company is shut down in rock at 3332 feet, waiting on fuel oil in Keiffer 1 in Section 11-18-4, Ashley County. H. H. Given, after a long fishing job and shut-down at 2800 feet, has resumed drilling in Garrett 1 in Section 1-13-19w, Garland County, and is drilling at 2968 feet.

Champagnolle continues at a comparatively low ebb in activity, there being only ten drilling operations now under way.

GEORGE BLARDONE

George Blardone, writer on petroleum and allied subjects, has joined the staff of the United Gas Company, which is under Moody-Seagraves management, to become manager of the company's publicity department. Mr. Blardone is well known to readers of THE OIL WEEKLY, to which he has contributed special articles on the petroleum industry in Mexico, its present status and its historical background, a subject on which he is recognized as an authority. For the past several months Mr. Blardone has been editing the petroleum columns of the Houston Post-Dispatch.

Thaw Permits Few Days Work in Montana

Great Falls, Mont.—A slight thaw immediately preceding the big storm for a time permitted the resumption of operations in the Montana fields. The Sunburst-Bear's Den well in the Sweetgrass Hills made progress with the fishing job and the crew started sidetracking the one string of tools left in the hole. This well should be one of the first completions in this interesting area which has heretofore given signs of being both oil and gas-producing.

Several wildcat operators started moving material and equipment to locations in various parts of the state, but their work came to an abrupt standstill in the big storm.

In the Kevin-Sunburst field three wells started to increase their production materially. They are Hannah-Porter Oil Company's Harte 3, Peerless-Steel's No. 1, and Radigan-Hungerford Company's Adam 1. There will be considerable drilling in the field this summer, according to present indications. Production in the field has decreased decidedly during the winter, due to the extreme cold and the difficulty of maintaining pipe line service.

Billy Creek

Casper, Wyo.—The discovery oil well in Billy Creek field, Johnson County, Wyoming, has not been tested yet because of the continued stormy weather. Two snowstorms have so blockaded the roads that it has been impossible to get to the location, and the crew at the well has been shut off from all communication for many days. Last week the Carter Oil Company opened the well up and found it standing filled with oil within 300 feet of the top. The well was bailed for a short time without appreciably lowering the fluid. Bailer upon being run to the bottom found 50 feet of mud and sediment. Further work was prevented by the storm.

Storm Stops Field Work

Casper, Wyo.—An unusually heavy fall of snow, extending across the Rocky Mountain state from Canada to New Mexico, has put a stop to all field operations in this territory. All wildcat wells are shut off from any communication whatsoever. Trains have been tied up and bus service has been suspended for more than a week. The refinery town of Greybull was flooded by an ice jam in the Big Horn River, and the damage to the community was estimated around $500,000. One man lost his life in a blizzard, but to date no other fatalities have resulted.

N. W. Hendershot, sales manager for Doheny Stone Drill Company, Torrance, California, left Los Angeles March 16 for a business trip to various eastern points, expecting to return home about April 1.

BUY OR RENT USED PIPE

and Save the Difference

15,000′—5-3/16″ Casing	50,000′—2″ Line Pipe
10,000′— 6⅝″ Casing	50,000′—3″ Line Pipe
5,000′— 8¼″ Casing	20,000′—4″ Line Pipe
5,000′—10″ Casing	15,000′—6″ Line Pipe
1,000′—12½″ Casing	5,000′—8″ Line Pipe
1,000′—15½″ Casing	

We will rent this casing or any other pipe which you may need. Let us finance your operations by carrying your pipe and casing investment for you.

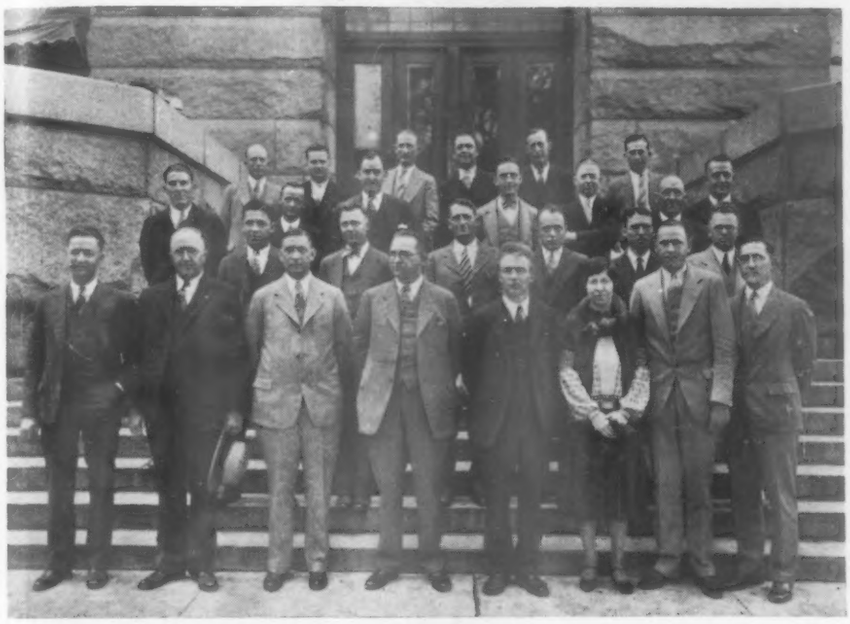
BRANCH STORES
Wichita Falls, Holliday, Vernon, Breckenridge, Pampa, Tex.

EASTERN HEADQUARTERS
Butler, Penna.

Keystone Pipe & Supply Co.

HOLMES BUILDING
FORT WORTH, TEXAS

With the Men in the Field



Rio Bravo Oil Company's field foremen, storekeepers and department heads are shown herewith, photographed during the semi-annual conference held January 17 and 18 at Houston headquarters. Rio Bravo Company, a subsidiary to the Southern Pacific Railroad, pioneered the idea of bringing its field men together twice a year for the purpose of exchanging operating ideas, new methods being developed in the field, planning development programs for the ensuing six months, and discussing business generally. The first such meeting was called several years ago by John R. Suman, then vice president and general manager of the company, and only field foremen attended. The practice has grown until storekeepers and department heads are also included, and at this recent meeting a number of papers were read by operating heads, covering subjects of importance to the company's interests. Safety in field work always takes an important part at these meetings.

Reading left to right in the group, they are as follows:

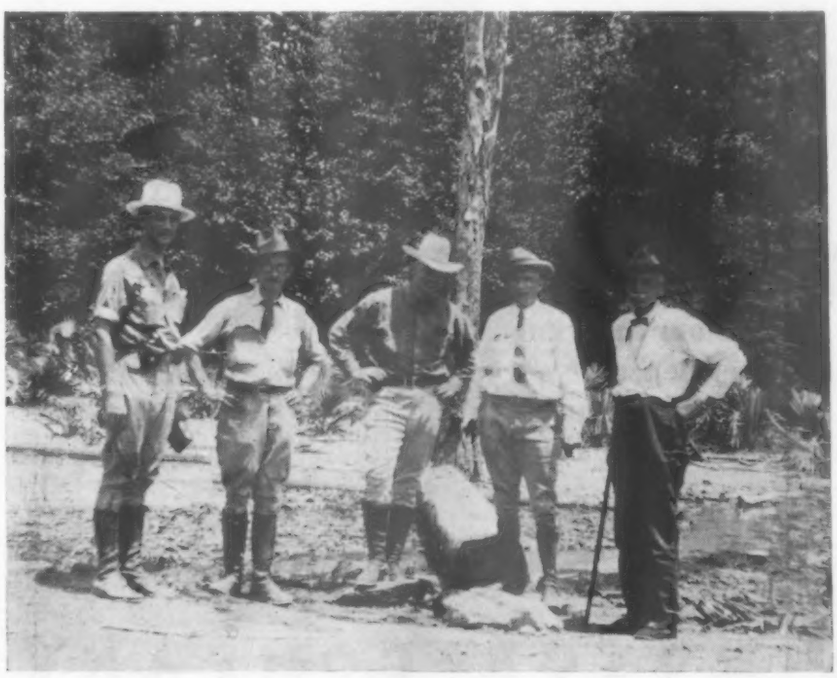
First row—S. T. Childress, division superintendent; M. C. McDowell, division superintendent; R. W. Shaw, assistant to vice-president and general manager; C. L. Baker, chief geologist; Miss Grace Newman, assistant paleontologist; Melbert Schwarz, chief engineer; J. M. Vetter, superintendent land and tax department, all of Houston office.

Second row—R. E. Russell, storekeeper, Electra; R. S. Martin, Jr., storekeeper, Pierce Junction; E. L. Spaugh, chief electrician, Pierce Junction; J. Zaba, engineer; R. G. Gray, assistant landman; L. E. Greene, draftsman, Houston.

Third row—J. A. Kirschke, assistant engineer, Houston; W. F. Tohill, storekeeper, Spindle Top; W. T. Radford, field foreman, Jacksonville; J. W. O'Brien, field foreman, Pierce Junction; C. E. Craddock, storekeeper, Saratoga; W. W. Lewis, field foreman, Electra; C. R. Dennis, accountant, Houston.

Fourth row—U. V. Seales, chief clerk to purchasing agent; W. E. Morrison, foreman, Wortham; L. E. McKinney, field foreman, Spindle Top; W. H. Sanders, Jr., chief clerk to vice-president and general manager; F. J. Hardey, Jr., chief clerk to division superintendent; J. V. Kuhlman, storekeeper, Luling.

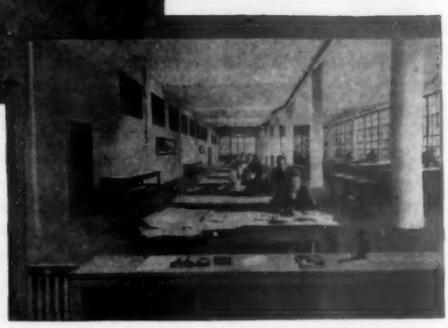
R. V. Plyer, field foreman, Saratoga; F. D. Wise, foreman, Hall County, and R. S. Greer, field foreman, Luling, were unable to attend this conference due to illness.



Inspection party in the Rockland District, East Texas, standing at the old location of Graham Saline No. 10 wildcat of Great Lakes Oil Company. Left to right: D. G. Barnett, Dixie Oil Company; Wm. B. Davis, East Texas Oil Company; Guy E. Green, Vacuum Oil Company; R. A. Rank, Navarro Oil Company, and J. P. Mettauer, early East Texas settler, serving as a guide to geological outcrops of interest

Lon Riggs, who won a nation-wide reputation as a writer of short stories dealing with life in the open West, bids fair to have as much success as an independent producer. Riggs quit the writing business two years ago to take a fling at wildcatting and made a 50-barrel well of his second test in Rogers County, Oklahoma. Since that success he has drilled a number of shallow wildcat holes around Claremore, and developed commercial gas production. He got most of his oil field education touring Oklahoma fields to write about oil, and for several years was oil editor of the Stroud, Oklahoma, Democrat.

Aeroplane view of the Waukesha Motor Company's plant at Waukesha, Wis. The two buildings in the foreground and the building paralleling the tracks are the important additions just completed.

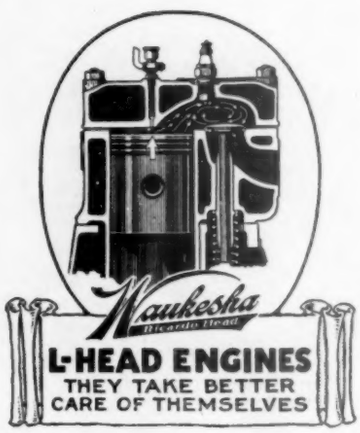


Engineering department of the Waukesha Motor Company. This is one of the largest drafting rooms, exclusively devoted to internal combustion engine design to be found anywhere.

WAUKESHA'S NEW FACTORY
...what it means to you...

New plant extensions increase our floor area 100 per cent and give additional engineering and production facilities for both our new engines and those which we have been building for some years past. Proving laboratories for both research and production engines are now in operation.

Adequate service department facilities—greater stocks and prompter shipments are assured by this expansion which we offer as our contribution to your business and as evidence of our faith in your continued and increasing future success. Write for bulletin 710, "What's New With Waukesha?"



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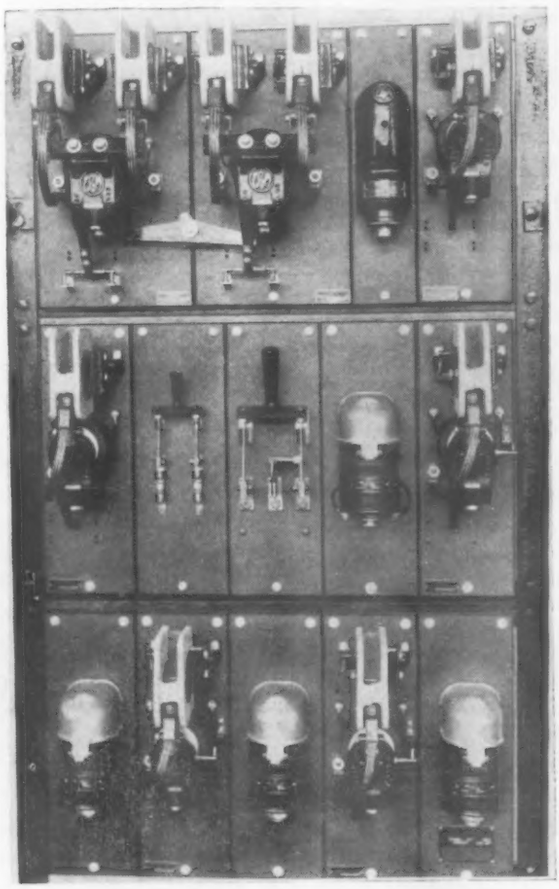
WAUKESHA MOTOR COMPANY

New York Tulsa **Waukesha, Wisconsin** Houston San Francisco

Exclusive Builders of Heavy-Duty Internal Combustion Engines for Over Twenty Years

Say you saw it in The OIL WEEKLY

NEW EQUIPMENT, CATALOGS, BULLETINS, BOOKS



New Electric Control

New Time Current Control

ELECTRIC CONTROLLER AND MANUFACTURING COMPANY

The electric Controller & Manufacturing Company, 2700 East 79th Street, Cleveland, Ohio, has announced a new system of control which uses an acceleration relay operating on a new principle.

The purpose of the Time-Current control on light loads, as screw downs, mill tables and other drives where operation means increased production, is to give maximum output. On heavy loads, longer time up to two seconds per step is had automatically, without any change in adjustment. On normal loads, forced acceleration gradually increases the torque until the motor eventually starts.

This new Time-Current control, which embodies the new time-current acceleration relay, also uses complete new line of shunt contactors and a new plugging relay.

Wagner Electric Corporation of St. Louis, has issued a new bulletin, No. 161, containing instructions for the installation and operation of power and distribution transformers. This bulletin, a 20-page affair, goes into detail regarding construction as well as installation and operation, and covers such subjects as location of transformers, their storage, handling and installation, drying core and coils, drying and testing oil and proper operating temperature. A copy of Bulletin No. 161 will be mailed to anyone interested upon request to the company.

Lyne-Kote Pipe Coating

SHERWIN-WILLIAMS COMPANY

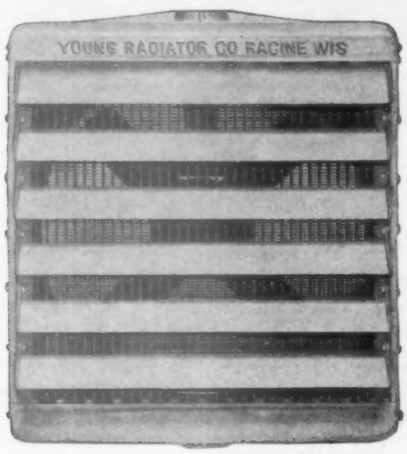
Sherwin-Williams Company, 601 Canal Road, N. W., Cleveland, Ohio, has its new Lyne-Kote, an elastic coating for protecting pipe against soil corrosion, on the market following completion of experimental tests to prove the lasting qualities and efficiency of the new product.

An outstanding feature of this new protective coating is that it is applicable either hot or cold. It is made to withstand air, moisture, acids, alkali and oil. It is said to be not brittle at 32°F. nor soft at 160°F.

Lyne-Kote consists of inhibitive oils blended with coal tar and other ingredients added in proper proportions. It is made to serve as a part of the pipe itself, expanding and contracting with the pipe.

In applying Lyne-Kote the pipe surface must be clean and free from all oil, grease, dust, sand, moisture, rust and mill scale. The first coat is a Lyne-Kote primer applied with a brush. The second coat, if applied cold, is made by the brushing method while the hot application is applied with the canvas method.

Further details concerning Lyne-Kote will be given upon request to the company's above address or branch distributors.



Young Heater Unit

New Type Heater Unit

YOUNG RADIATOR COMPANY

Young Radiator Company, Racine, Wisconsin, has a new type of unit heater with an all-copper condenser core and a number of other new advantages. This new unit, Model 712, weighs only 125 pounds and can be installed eight to 12 feet from the floor so as to be out of the way, and requires less than three cubic feet of wall space.

It is particularly adaptable to plants, factories, warehouses, airplane hangars, garages and maintenance plants.

Model 712 unit heater effectively delivers heat equivalent to a minimum of 5000 pounds of cast iron radiation and condenses steam equivalent to a minimum of 600 square feet of cast iron radiation. It can be suspended directly from the steam main without any additional bracket or rod supports, making it possible to face it in any direction desired at any time.

The condenser consists of flattened vertical copper tubes which diffuse the greatest amount of heat quickly, yet take full circulation and eliminate clogging. The adjustable deflectors

direct the warm air from the condenser in any direction desired, keeping an even heat temperature at the floor and ceiling.

To insure against leakage resulting from excessive steam pressures the condenser tubes are brazed to the header plates. Allowance is made for expansion and contraction due to temperature changes, and is guaranteed against bursting from freezing.

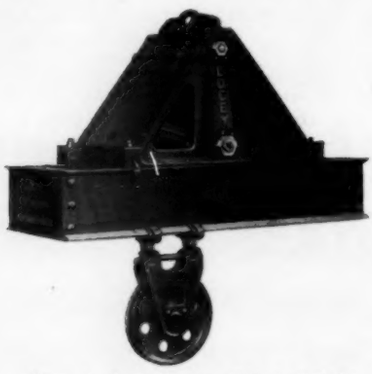
Model 712 is simple in construction, any mechanic being able to remove the condenser, or motor and fan assembly in a few minutes.

New Five-in-Line Crown Block

LUCEY MANUFACTURING CORPORATION

The new "Five In Line" Crown Block, J-6500, being marketed by the Lucey Manufacturing Corporation, Chattanooga, Tennessee, is built for speed, is equipped with roller bearings and large diameter sheaves, and is of a massive construction to lend strength.

This block is 52¼ inches high, 35 inches wide, seven feet long, weighs 4720 pounds complete. Weight of the cat-line sheave is 255 pounds.



Five in line Crown Block J-6500

Two 15-inch, 70-pound, seven feet long "I" beams held together by suitable reinforced spacers and six ⅞-inch bolts, make up the frame. The main shaft has a six-inch diameter, alloy forged steel, heat treated, and has separate ducts to each bearing for Alemite lubrication. The upper pin is of four-inch diameter. The sheaves are of 36-inch O. D. manganese steel, all mounted on the main shaft.

American heavy duty roller bearings are contained in a cage and provided with hardened steel sleeves and casings which eliminate all wear on the shaft and sheeve wheel. The side bars are of electric cast steel, 90,000-pound tensile strength. Spacer plates are five-eighths-inch thick boiler plate of 55,000-pound tensile strength.

SUCKER ROD BULLETIN

S. M. Jones Company, Toledo, is distributing a new price list booklet for Jones Sucker Rods and other pumping equipment manufactured by this company. Page or half-page space in this 22-page booklet is devoted to single items, which are illustrated by photographs, and sizes, weights and prices are listed for equipment and parts. A copy of this booklet will be furnished upon request to the company.

Happy Belting Company has moved to its new building at 310 East 10th Street, Tulsa. It was formerly located at 317 West Second Street. Its new building is a first class supply house, built to purposely handle the company's business.

RIVETING HAMMER BULLETIN

Chicago Pneumatic Tool Company has off the press its bulletin, SP-1694, which covers Boyer Riveting Hammers. The center spread of this bulletin announces that an improved and hardened and ground valve unit will be furnished with all Boyer hammers, unless otherwise ordered.

In addition to announcing this refinement, the publication covers the subject of Boyer riveting hammers thoroughly. A copy will be mailed upon inquiry to the company's headquarters, 6 East 44th Street, New York City.

WICKWIRE SPENCER CATALOG

The Wickwire Spencer Steel Company, 41 East 42 Street, New York City, announces its new complete catalog, revised and brought up to date as of January 1, 1929. The catalog is Number 115, and copies are available upon request to the company at the above address.

AMERICAN CABLE CATALOG

The American Cable Company, Grand Central Terminal Building, New York City, has recently published a new catalog giving full descriptions and illustrations of their various products. Copies of this catalog are available upon request to the company.

TWIN DISC BULLETIN

A new loose-leaf folder of engineering data on twin disc clutches and power take-off machinery is just off the press and will be sent on request to the Twin Disc Clutch Company, Racine, Wisconsin.

SIMPLEX JACKS

Simplex jacks and trench braces are described in a new catalog recently issued by the Templeton, Kenly & Company, Ltd., of 1020 South Central Avenue, Chicago. A copy will be sent on request to the company.

O'BANNON CATALOG

The Walter O'Bannon Company, 400 South Rockford Street, Tulsa, has recently compiled a new catalog on its oil field specialties which may be had by request to the company.

SULLIVAN CATALOG

The Sullivan Machinery Company, 122 South Michigan Avenue, Chicago, announces its new catalog, Number 85-B, which lists in full detail, the various items of supplies and equipment necessary in the operation of the diamond core drilling machine. A copy of the catalog will be furnished by request to the company at the above address.

ALUMINUM BOOKLETS

The "Coat of Metal Protection" and "Strong Aluminum Alloys" are the titles of two attractive booklets announced by the Aluminum Company of America, Pittsburgh. Copies of these books may be secured by request to the company.

Trinidad Leaseholds, Ltd., of Trinidad, British West Indies, recently placed an order with the Central Alloy Steel Corporation, Massilon, Ohio, for 11 miles of Toncan Iron pipe, the manufacturer's new rust-resisting product. This pipe will be used for oil gathering lines, and will be supplied in 30-foot lengths with ends grooved for Victaulic couplings.

R. H. Pence and associates have opened offices at 1910 Cherry Avenue, Long Beach, operating under the name of Signal Engineering Company. The organization is catering to flowing oil well control, gas lift installations, gas accounting, gas engineering in general, and oil field construction. Mr. Pence for several years has been connected with the Bessemer Gas Engine Company, installing compressor plants and gas lifts, and engaged in gas engineering in general.

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Squeaks from the Bull Wheel

Here's one John L. Hamilton, advertising manager of the International Derrick & Equipment Company of Columbus, Ohio, is telling:

A church was giving a play, during which the hero was to be shot. When shot, the hero was to exclaim, "My God, I'm shot!" At the last minute the actor taking this part was stricken with flu, and they were obliged to run the preacher in as a pinch-hitter. He was willing, provided he could say, "My gracious!" instead of "My God!" Agreed.

During the play the villain put red catsup in his revolver. At the critical moment, when shot, the preacher exclaimed:

"My gracious, I'm shot!"

Then, feeling and seeing the catsup, the preacher shouted:

"Hell's bells, I AM shot!"

Please tell me your story, ancient mariner.

Well, once we were stranded, had to eat our belts and shoes to live. And then the boat turned turtle and we lived on that for six days.

What's the subject matter of that poem you are writing?

It doesn't.

Say your prayers louder, darling. I can't hear you.

I wasn't speaking to you, mummie.

How do you like your new neighbors?

Great! they are the most unfriendly people I ever saw.

My head was grazed by a bullet at the battle of Chickamauga.

There isn't much grazing there now, is there, grandpa?

Cop (telephoning): "A man has been robbed and I've got one of them."

"Fine! Which one did you get?"

"The man who was robbed."

I want to get a typewriter.

Any special type?

I prefer a blonde.

I mean model.

No, I don't want her too perfect.

Uplifter—And what is your name, my good man?

Convict—1499.

Oh, but that's not your real name?

Naw, that's only my pen name.

I happen to know that fellow is a sharper and not above lying or stealing when it's to his advantage.

Then you know him?

Know him? Say, I taught that fellow everything he knows.

Is Harold still mopping floors at the hotel?

Yes, he's still the same old floor flusher.

Why did you join the Salvation Army?

So I could play my cornet in public.

"You're so dumb I wouldn't call you a ham."

"Why not?"

"A ham can be cured."

"Jed stole a chicken last night and got up before the judge."

"What did the judge do?"

"He married them."

"Did the cowboys teach you to ride that outlaw horse?"

"No, I was thrown on my own resources."

Neighbors used to drop in for a call; now they call in for a drop.

A dinner party, attended by several vaudeville artists, was given in a Chicago restaurant. A Scotchman was present. At the end of the elaborate and expensive meal, to the astonishment of everybody, the Scot was heard to call for the bill, which was in due course handed to him.

Next day the newspapers printed a sensational story under the heading of "Scotchman Murders Ventriloquist."

The Postcard Traveler died. He had no more than reached his destination when he approached the manager.

"Where can I buy a card," he asked, "to tell my friends I wish they were here too?"

"Nowhere," grinned Satan; "That's the hell of it."

A witness was testifying in a case concerning cubic measure, but it was evident from his loose, vague talk that he didn't know exactly what cubic measure was. The judge, to test him, said:

"Now, friend, look at this inkstand. Let us assume that this inkstand is one yard across the top this way, and one yard across the top that way, and one yard deep, how would you then describe it?"

The witness chuckled: "I'd say, judge, she was some inkstand."

Yes, miss, you'll find most ladies like this lipstick.

You couldn't—ah—tell me the kind that men like, could you?

TIGHT TANKS
— FIELD RIVETED —

Tanks of standard designs and capacities are carried in stock at both Pittsburgh-Des Moines shops—in Pittsburgh and in Des Moines. These are completely fabricated and ready for immediate shipment. Write for prices to the office nearest you.

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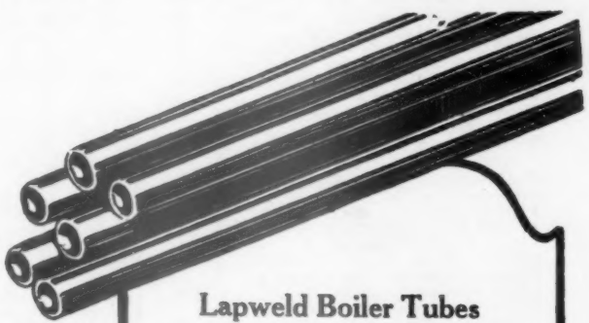

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INDEX TO ADVERTISERS

J. S. Abercrombie Company 15
Ajax Iron Works .....
Ala, Haasenstein & Vogler .....
Alco Oil Tools Company.....
Allis-Chalmers Manufacturing Co. ....
Allsteel Products Manufacturing Co. ..
Alten's Foundry & Machine Works ...
Aluminum Company of America .....
American Association of Petroleum Geologists .....
American Cable Company .....
American Hammered Piston Ring Co...
American Iron & Machine Works ...
American Telephone & Telegraph Company .....
American Steel Works .....
American Wells Works 96
Andrews Steel Company 129
B. K. Appleman .....
Paul Arbon & Company .....
Ash Grove Lime & Portland Cement Company 79
Askania-Werke, A. G. .....
Athey Truss Wheel Company .....
Axelson Machine Company ....4th Cover

Baash-Ross Tool Company 6
Baker Oil Tools, Inc. 40
Baldwin Chain Company .....
Barber-Greene Company .....
William S. Barnickel & Company.....128
Bartlett Hayward Company .....
Bartlesville Supply Company .....
Beaumont Iron Works 91
Beebe Brothers .....
Ben Milam Hotel .....
Bessemer Gas Engine Company .....
Bethlehem Steel Company .....
Boykin Machinery & Supply Company.. 39
The Brewster Company 50
Bridgeport Machine Company..... 35
Broderick & Bascom Rope Company...
Buckeye Traction Ditcher Company ...113
Buffalo Bolt Company 74
Burns Tool Company .....
Butler Manufacturing Company .....
A. M. Byers Company .....
Byron Jackson Pump Company .....

Cambridge Instrument Company 98
Cameron Iron Works .....
Phillip Carey Company .....
Central Alloy Steel Corp. 71
Chain Belt Company 81
Chicago Bridge & Iron Works .....
Chicago Pneumatic Tool Company .....
Clark Brothers Company 11
Climax Engineering Company .....
Coastal Oil Finding Company 118
Colona Manufacturing Company .....
Columbia Nut & Bolt Company .....
Continental Motors Corporation .....
Continental Supply Company 42
C. & G. Cooper Company .....
Fred E. Cooper .....
Crescent Belt Fastener Company..... 96
Cyclone Fence Company 129

D. & B. Pump & Supply Company..... 83
Darling Valve & Manufacturing Co. ..111
E. M. Dart Manufacturing Company...114
F. E. Delahoussaye .....
Diamond Drill Carbon Company 114
Disc Bit Division Byron Jackson Pump Company .....
Drane-Humphrey Company, Inc. .....
Dunn Manufacturing Co. .....

E. I. du Pont de Nemours & Co., Inc. .....
Economy Pump & Oil Tool Company...
E. H. Edwards Manufacturing Co. 75
Electric Controller Manufacturing Co...103
Elliott Core Drilling Co. 9
Emsco Derrick & Equipment Company..

Fenwick-Reddaway Manufacturing Co. .
Fort Worth Laboratories 118
Franklin Valveless Engine Company ... 93
Freeman Thompson Shoe Company ...
Frick-Reid Supply Corporation .....

Garlock Packing Co. 129
Gardner-Denver Company 105
Gaso Pump & Burner Manufacturing Company 3
General Electric Company .....
B. F. Goodrich Rubber Company ...
H. P. Gott Manufacturing Company ...
Gray Tool Company .....
Guiberson Corporation 54
Gulf Caribbean Steamship Company ...
Gulf Publishing Company .....
Gulf Refining Company 73
Gulf States Utilities Company 37

Halliburton Oil Well Cementing Co.... 16
Erle P. Halliburton Company .....
Hardway & Cathey 118
Haynes Stellite Company .....
Harrisburg Pipe & Pipe Bending Company .....3rd Cover
Harrisburg Pipe & Pipe Bending Company of Texas .....
Hazard Wire Rope Company .....
Hercules Motors Corporation .....
Hercules Supply Company .....
Hercules Tool Company .....
Heydrick Mapping Company 118
Hill, Hubbell & Company 117
Hinderliter Tool Company .....
Hirsch, Brown & Susman 118
Houma Chamber of Commerce .....
Charles N. Hough Manufacturing Co. 82
Houston Engineers .....
Hughes Tool Company .....Front Cover
Hyatt Roller Bearing Company .....
Humble Oil & Refining Company 14

Imperial Royalties Company.....
Ingersoll-Rand Company .....
International Derrick & Equipment Company 4-5
International Supply Company .....
Interstate Trust & Banking Company ..

Jarecki Manufacturing Company .....
Jensen Brothers Manufacturing Co. ... 94
S. M. Jones Company 94
Jones & Laughlin Steel Corp 8

Kennedye-Plumb Corporation .....
Kerotest Manufacturing Company 97
Keystone Pipe & Supply Company ...122

Landis Machine Company .....
Larkin & Company .....
La Salle Hotel .....
Layne & Bowler Company 58
LeBus Rotary Tool Works .....
Robert E. Lee Hotels .....
Lincoln Electric Company 115
Linde Air Products Company .....
Link-Belt Company .....
Louisiana National Bank .....
Lucey Products Corporation .....
Ludlow Valve Manufacturing Company

Maintenance Engineering Corporation..128
Magnolia Petroleum Company .....
I. H. McEvoy & Company .....
Maloney Tank Manufacturing Co. 92
McCollum Exploration Company 118
Manzel Brothers Company ....
Martin-Loomis Corporation ....
Martin Wagon Company .....
Mason Regulator Company 114
Phillip Maverick .....
Mead Morrison Company ....
Samuel L. Mellon .....
Metric Metal Works .....
Miller Combination Bailer & Pump Company .....
Robert J. Miller Company .....
Mission Sales Company .....
Lee C. Moore & Company .....
Munger Oil Information Service ....
Murray Brooks Hardware Company...
Murray Tool & Supply Company ....

National Petroleum Engineering Co....14
National Supply Companies 127
National Transit Pump & Machine Company .....
Norris Brothers .....
Norvell-Wilder Hardware Company 7
R. D. Nuttall Company .....
Nye Tool & Machine Works 7

Oakite Products, Inc. .....
O'Brien Steel Construction Company..
O. C. S. Manufacturing Company ...106
Oil Well Supply Company 18
Oklahoma Gas & Electric Company...
Oxweld Acetylene Company .....

Parkersburg Rig & Reel Company ... 95
Patterson-Ballagh Corporation 89
Pattin Brothers Company .....
Peden Iron & Steel Company .....
Penberthy Injector Company .....
Petroleum Engineering University ....
Petroleum Rectifying Company 46
Pittsburgh Des Moines Steel Co. 129
Pittsburgh Equitable Meter Company
Pittsburgh Steel Products Company.... 77
Pratt & Whitney Company .....
Price, W. A. .....

Reading Iron Company .....
Reed Roller Bit Company .....
Regan Forge Engineering Co. .....
Joseph Reid Gas Engine Company....109
Republic Supply Company 107
Republic Iron & Steel Company .....
Rhode Island Fitting Company .....
Rhodes Master Packing .....

Safety Pulling Machine Company ...
Sam Houston Hotel .....
Shaffer Tool Works .....
Sinclair Refining Company 49
Skelly Oil Company .....
S-K-F Industries .....
A. O. Smith Corporation .....
Smith Separator Co. .....Second Cover
H. C. Smith Manufacturing Company 63
Howard Smith Company 116
South Chester Tube Company .....
Southern Blue Print Supply Co. 118
Southern Engine & Pump Company ..
Southern Mill & Manufacturing Co....
Spang & Company .....
Spang Chalfant & Company 13
Springfield Wagon Company .....
Standard Steel Works .....
Standard Supply & Hardware Co. ...
Stanley Belting Corporation .....
Star Drilling Machine Company ....
St. Charles Hotel .....
Jesse R. Stone 118
Sullivan Machinery Company 98
Sweetwater Board of City Development

Taubman Supply Corporation .....
Templeton, Kenley & Company .....
Texas Creosoting Company .....
Texas Cyclone Fence Company ....
The Texas Company .....
Texas Power & Light Company ....
Timken Roller Bearing Company 12
Texas Sand & Gravel Company 118
Titusville Iron Works .....
Triad Products Company .....
Trimont Manufacturing Company ....
Trumble Gas Trap Company .....
Twin Disc Clutch Company .....
Tyler Tube & Pipe Company 129

Union Carbide & Carbon Corporation
Union Wire Rope Corporation .....
United Iron Works .....
United States Torpedo Company ....

Victaulic Company of America 101
The Vez Company 53

Waukesha Motor Company 124
John F. Weinzierl 118
Westinghouse Electric & Manufacturing Company .....
Wichita Falls Motor Company 10
West Texas Utilities Company .....
Wickwire-Spencer Steel Company ...
Wico Electric Company .....
Wiemann-Kemmerer-Wright, Inc. .....
I. H. Williams & Company .....
Williamsport Wire Rope Company ...
Wilson Oil Tools Corporation 17
Wilson-Snyder Manufacturing Co. ...119
Wilson Supply Company .....
W-K-M Company .....
Word Specialty Mfg. Company 85
Wright Manufacturing Company ....

Yale & Towne Manufacturing Company
Young Engine Corporation .....

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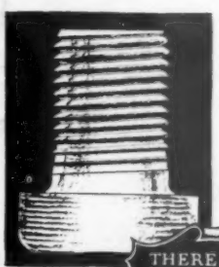

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